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THE IRON TRADE REVIEW

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Vol. LXIII No. 10

CLEVELAND, SEPTEMBER 5, 1918

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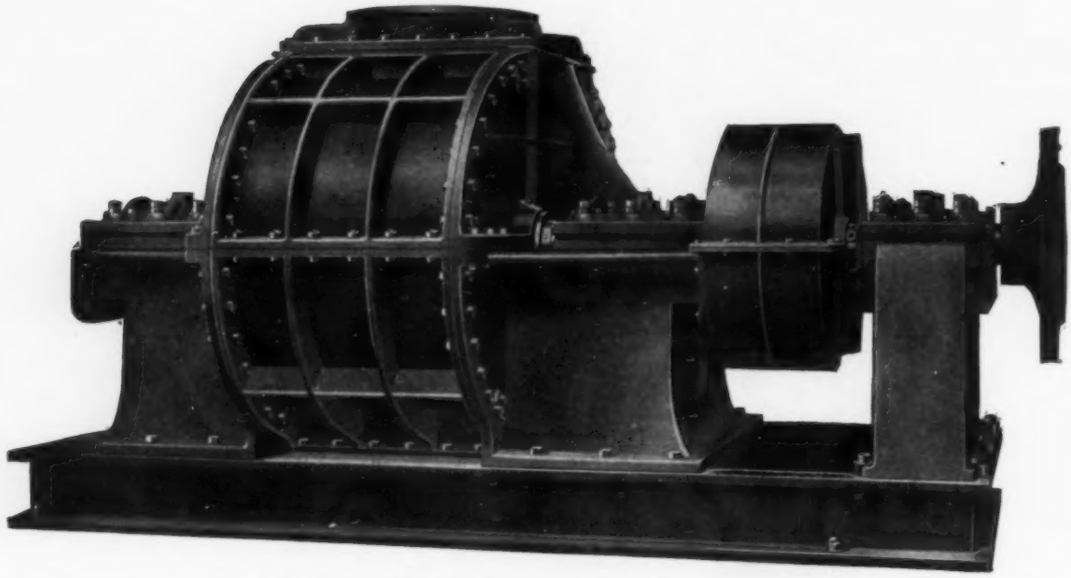

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Although they are the type of simplicity, they possess all the features of practical construction, resulting from years of experience.

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THE CONNERSVILLE BLOWER CO.

CHICAGO
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CONNERSVILLE, IND.

NEW YORK
114 Liberty St.

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BIG BILL HAYWOOD and his gang of Incorrigible, Wanton Weevils can thank their lucky stars that justice in the United States is tempered with mercy. It was merciful to the I. W. W. leaders that they should have received sentences of 20 years in the federal penitentiary at Leavenworth and fines of $20,000 and that the lesser lights in this organization, the crack-brained cranks, whose power for evil was not so great as their will, should have received five and ten-year sentences. The very government they attempted to do to the death saved their lives, granted them clemency for an offense that warranted their execution.

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MODERN warfare is conducted largely through mechanical means and the fact that American manufacturers have been able to meet the abnormal demands of the government is due, in a great measure, to the efficient manner in which present-day drafting rooms are managed, because all mechanical ideas must first be developed on the drawing board.

A decade ago, American drafting room practice, in the majority of cases at least, fell far short of being conducted on an efficient basis. For some unexplainable reason, perhaps because some of the old-school manufacturers established a precedent by adhering to rule-of-thumb methods, the average drafting room was never considered seriously.

An investigation of the drafting room of other days usually disclosed the fact that the majority of the men employed were derived from two sources; engineering students who originally took up the work to acquire practical experience, and young men, averse to manual labor, who wished to wear good clothes and make a living at the same time.

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the services of efficient men, attractive salaries must be offered. The drafting room is no exception to this rule and instead of the few college boys and effeminate youths of other days, efficient men have turned their attention to drafting room work with a determination to make the most of an unusual opportunity. At the present time, the salaries paid in drafting rooms compare favorably with the wages received in other lines of endeavor.

The war has been responsible for these conditions. Manufacturers have been compelled to offer high wages to meet competition but in return they are deriving efficient results that were undreamed of a few years ago. The drafting room has been lifted in the scale of works importance and it is to be hoped that the efficient results gained thereby will be of a permanent character.

Crane Builders Meet All Demands

THE allotment at Washington recently of approximately 600 locomotive cranes is deserving of more than passing notice. Although representing the minimum requirements of the various departments of the government for the next few months, the allotment is unique inasmuch as it is by far the largest distribution of cranes ever made. It not only reflects forcibly the increasing enormity of the country's war program, but presents one of war's most striking anomalies—the vast amount of construction necessary in the prosecution of a task aimed to destroy.

Its greatest significance, however, lies in the fact that the allotment virtually will absorb the entire production of the locomotive crane industry for the next six months, thus indicating the manner in which builders are serving the government. It bespeaks cooperation, loyalty and all that makes for a determined spirit to win the war.

The allotment, though, does not necessarily mark the establishment of the locomotive crane industry on a 100 per cent war basis. Through the crane section of the war industries board in Washington, builders long since have been working hand in hand with the government, and have been giving over their production to direct or indirect war work. As a result of this co-operative effort, the locomotive crane industry, although relatively small, has been able to cope successfully with the heavy demands, and its organization has been so perfected that it will be able to handle the recent huge allotment with no extraordinary preparations or exertion.

Steel Control After the War

HOW long after the war will the government hold the reins of the iron and steel industry? Certainly until the country's demands for iron and steel products are satisfied. For if a free market is established before that time, prices are bound to soar to the level or even beyond the level of those which existed before the government took hold. Take tin plate, for instance. Practically every pound of tin plate being made is used for war purposes. A large per cent of the output is distributed to the canning and packing industries for making containers in order to supply our army abroad with canned goods. If the war should end tomorrow and the government let down the bars of tin plate control, buyers all over the country would rush to the mills and present their demands. As a result the output of the mills would soon be sold up for months ahead. Consumers who were unsuccessful in having their demands for tin plate satisfied would be willing to pay a substantial premium for the privilege of getting their names on the books. This condition would not be slow in spreading and the price of tin plate would soon reach the high mark of 1917. In the meantime, with the supply of tin plate cut off from the canneries and meat packing companies, what would become of our army in France? A million and a half men could not be brought back to this country over night and while they are over there they must be fed.

Then again, when the reconstruction period begins where is all the steel to come from? It certainly will not come from Germany or Austria. England, France, Russia and Belgium are in no industrial position to meet the demands fully, so that practically the only ray of hope lies in the production of the iron and steel mills in this country. If our government does not maintain control of the iron and steel distribution and prices, foreign buyers will swarm into this country and in order to obtain material, will offer enticing prices. If you have a product for sale you expect to get the highest price for it. So with the iron and steel manufacturer. He will sell to the highest bidder and if that bidder is from a foreign country, naturally a larger per cent of our steel commodities will go into foreign channels.

The French, no doubt, will make changes in their northern railway system which will mean the complete rebuilding of tracks and bridges and will require vast quantities of rails, locomotives and track material. Naturally, the French will turn to this country for their supply. They have always been accustomed to the little 10-ton buggies which traverse their railway system. But the coming of the Americans with their 50-ton hopper cars and other up-to-date equipment has shown the French how obsolete their equipment is when hauling large loads.

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The humid weather in August was reflected in the figures of pig iron production. The output last month was 3,392,576 tons against 3,408,584 tons in July. The record-breaking number of furnaces in blast continues to be increased. The total at the end of August was 370 compared with 364 at the close of July.

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Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 586

PIG IRON

Bessemer, valley	$35.20
Bessemer, Pittsburgh	36.60
Basic, Pittsburgh	33.40
Basic, eastern Pa.	32.00
Basic, Buffalo	32.00
Malleable, Pittsburgh	34.90
Malleable, Chicago	33.50
Malleable, Buffalo	33.50

GOVERNMENT SCHEDULE

1.75 to 2.25 silicon (No .2 foundry, No. 2 plain, and No. 3 southern), $33 furnace base.

2.25 to 2.75 silicon (No. 2X, No. 1 Northern foundry, and No. 2 southern), base plus 50c.

2.75 to 3.25 silicon (No. 1X, No. 2, soft), base plus $1.50.

Over 3.25 silicon, $34.50, plus $1.00 for each ½ per cent of silicon.

No. 1X, Phila.	35.25 to 35.50
No. 2 foundry, Pittsburgh	34.40
No. 2 foundry, Cleveland	33.00
No. 2 foundry, Ironton	33.00
No .1 foundry, Chicago	33.50
No. 2 foundry, Chicago	33.00
No. 2X foundry, Phila.	34.25 to 34.50
No. 2X foundry, N. J. tide	34.25 to 34.50
No. 2X foundry, Buffalo	33.50
No. 2 plain, Philadelphia	33.75 to 34.00
No. 2 plain, N. J. tide	33.75 to 34.00
No. 2 southern Birmingham	33.00 to 33.50
No. 2 southern, Cincinnati	37.10
No. 2 southern, Chicago	38.50
No. 2 southern, Phila.	40.10
No. 2 southern, Cleveland	38.50
No. 2 southern, Boston	41.00
No. 2 southern, St. Louis	39.75
Virginia, No. 2X, furnace	33.50
Virginia, No. 2X, Phila.	37.60
Virginia, No. 2X, Jersey City	37.90
Virginia, No. 2X, Boston	38.20
Gray forge, Pittsburgh	33.40
Silveries, 8 per cent, furnace	45.50
Silveries, 8 per cent, Chicago	48.50
Low phos. standard, Phila.	56.00
Low phos. Lebanon, furnace	50.00 to 52.00
Low phos., Pittsburgh standard	54.40
Charcoal, Superior, Chicago	37.70 to 38.00
Charcoal, Superior, Buffalo	37.50
Charcoal, southern to 2 per cent silicon	50.00

COKE

(At the ovens)

Connellsville furnace	$6.00
Connellsville foundry	7.00
Pocahontas furnace	8.00
Pocahontas foundry	8.00
New River foundry	8.00
New River furnace	8.00
Wise county furnace	7.25
Wise county foundry	8.25

FERROALLOYS

Ferromanganese, 70 per cent delivered	250.00
Spiegel, 16 per cent fur., spot	75.00
Spiegel, contracts, furnace	75.00
Ferrocarbon titanium, carloads, maker's plant	200.00
Ferrosilicon, 50 per cent, third quarter, Pitts.	150.00 to 152.50
Ferrosilicon, 50 per cent, Pitts., remainder of 1918	150.00 to 152.50
Bessemer ferrosilicon, 10 per cent	55.00
Bessemer ferrosilicon, 11 per cent	58.30
Bessemer ferrosilicon, 12 per cent	61.60

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O.

SEMIFINISHED MATERIAL

BILLETS AND BLOOMS

Open-hearth, Pittsburgh	$47.50
Open-hearth, Philadelphia	51.30
Open-hearth, Youngstown	47.50
Bessemer, Pittsburgh	47.50
Bessemer, Youngstown	47.50
Forging, Pittsburgh	60.00
Forging, Philadelphia	63.80

SHEET BARS

Open-hearth, Pittsburgh	$51.00
Open-hearth, Youngstown	51.00
Bessemer, Pittsburgh	51.00
Bessemer, Youngstown	51.00

SLABS

Pittsburgh and Youngstown.	$50.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$57.00
Grooved skelp, Pittsburgh	2.90c
Sheared skelp, Pittsburgh	3.25c

SHAPES, PLATES AND BARS

(In cents per pound)

Structural shapes, Pitts.	3.00c
Structural shapes, Phila.	3.23c
Structural shapes, N. Y.	3.245c
Structural shapes, Chgo.	3.27c
Tank plates, Chicago	3.52c
Tank plates, Pittsburgh	3.25c
Tank plates, Philadelphia	3.48c
Tank plates, New York	3.495c
Bars, soft steel, Pittsburgh	2.90c
Bars, soft steel, Chicago	3.17c
Bars, soft steel, New York	3.145c
Bars, soft steel, Phila.	3.13c
Bar iron, Phila.	3.73c
Bar iron, Chicago	3.50c
Bar iron, Cleveland	3.67c
Bar iron, New York	3.745c
Bar iron, Pittsburgh	3.50c
Hard steel bars, Chicago	3.00c

RAILS, TRACK MATERIAL

Angle bars, Pittsburgh base.	3.25c
Angle bars, Chicago base	3.25c
Standard bessemer rails, mill	$55.00
Stand. open-hearth rails, mill	57.00
Light rails, 25 to 45, mill	3.00c
Relaying rails, light, St. L.	60.00 to 67.00
Spikes, railroad, Pitts.	3.90c
Track bolts, Pittsburgh	4.90c
Track bolts, Chicago	5.115c
Tie plates, Chicago	3.25c

WIRE PRODUCTS

(Per 100 lbs. to jobbers; retailers 5c more)

Wire nails, Pittsburgh	$3.50
Coated nails, Pittsburgh	3.45
Plain wire, Pittsburgh	3.25
Galvanized wire, Pittsburgh	3.95
Polished staples, Pittsburgh	3.65
Galvanized staples, Pbgh.	4.35
Barb wire, painted, Pitts.	3.65
Barb wire, galvanized, Pitts.	4.35
Cut nails, Pittsburgh	4.00

CHAIN, PILING, STRIP STEEL

(In cents per pound)

Chain, 1 in. proof coil, Pitts.	7.50c
Sheet piling, base, Pitts.	4.00c to 5.00c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 6.50c.

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SHEETS

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c
No. 28, open-hearth, Chi.	5.27c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c

GALVANIZED

No. 28, open-hearth, Pitts.	6.25c
No. 28, bessemer, Pitts.	6.25c
No. 28, open-hearth, Chi.	6.52c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	4.25c
No. 10, bessemer, Pitts.	4.25c
No. 10, open-hearth, Chi.	4.52c
No. 10, open-hearth, Phila.	4.48c

TIN PLATE

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.75

IRON AND STEEL PIPE

Base Pittsburgh

Base, Pittsburgh	Black (Per cent off)	Galv. (Per cent off)
¼ to 3 in., butt, steel	51	37½
¼ to 3 in., butt, iron	33	17

BOILER TUBES

Steel, 3½ to 4½ inches, l. c. l.	30
Iron, 3½ to 4½ inches, c. l.	12½

CAST IRON WATER PIPE

Without War Freight Tax

(Class B Pipe)

Class A pipe is $1 higher than Class B.

Four-inch, Chicago	64.80
Six-inch and over, Chicago	61.80
Four-inch, New York	65.70
Six-inch and over, N. Y.	62.70
Four-inch, Birmingham	58.00
Six-in. and over, Birmingham	55.00

HOOPS, BANDS, SHAFTING

Hoops, Pittsburgh	3.50c
Bands, Pittsburgh	3.50c
Hot rolled strip steel, Pitts.	3.50c
Hot rolled strip steel, Pitts. stamping quality	4.00c
Shafting, Pitts., carloads	17 off to list
Cotton ties, Sept., per bundle	$1.95

RIVETS

Structural rivets, Pittsburgh.	4.40c
Boiler rivets, Pittsburgh	4.50c
Rivets ⅞ in. & small., Pitts.	50 and 10 off

NUTS AND BOLTS

(Prices f.o.b. Pittsburgh)

CARRIAGE BOLTS

(¾ x 6 inches, smaller and shorter)

Rolled thread	50–5 off
Cut thread	40–10–5 off
Larger and longer	40 off

MACHINE BOLTS

(¾ x 4 inches, hot pressed nuts)

Rolled thread	50–10–5 off
Cut thread	50–5 off
Larger and longer	40–10 off
Cold pressed semifinished hexagon nuts ¾ in. and larger	60–10–10 off
Cold pressed semifinished hexagon nuts ⅞ in. and smaller	70–5 off
Gimlet and cone point lag screws	50–10 off

NUTS

Hot pressed, square blank	2.50c off
Hot pressed, square tapped	2.30c off
Hot pressed, hexagon blank	2.30c off
Hot pressed, hexagon tapped	2.10c off
Cold pressed, square blank	2.25c off
Cold pressed, square tapped	2.00c off
Cold pressed, hexagon blank	2.25c off
Cold pressed, hexagon tapped	2.00c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Quotation on leading products September 4, average for August 1918, average for June 1918, and average for September 1917. Prices are those ruling in the largest percentage of sales at the dates named.

	Prices Sept. 4, 1918	Average prices Aug., 1918	June, 1918	Sept., 1917
Bessemer pig iron, Pittsburgh	$36.60	$36.60	$36.38	$48.27
Basic pig iron, Pittsburgh	33.40	33.40	33.17	43.95
*No. 2 Foundry pig iron, Pitts.	34.40	34.40	34.17	48.95
*No. 2, Foundry pig iron, Chi.	33.00	33.00	33.00	49.50
Lake Superior charcoal, Chicago	37.70	37.70	37.50	59.50
Malleable, valley	33.50	34.90	34.67	50.57
Malleable, Chicago	33.50	33.50	33.50	49.50
**Southern, No. 2, Birmingham	33.50	33.50	33.50	43.50
*Southern Ohio No. 2, Ironton	33.00	33.00	33.00	49.25
Basic, eastern Pa	32.00	32.00	32.00	49.50
**No. 2X Virginia, furnace	33.50	33.50	33.50	50.75
**No. 2X foundry, Philadelphia	34.50	34.50	34.25	52.25
Ferromanganese, 70%, delivered	250.00	250.00	250.00	378.00
Bessemer billets, Pittsburgh	47.50	47.50	47.50	73.75
Bessemer sheet bars, Pittsburgh	51.00	51.00	51.00	82.50
Open-hearth sheet bars, Pitts.	51.00	51.00	51.00	82.50
Open-hearth billets, Pitts.	47.50	47.50	47.50	73.75
Steel bars, Pittsburgh	2.90	2.90	2.90	3.72
Steel bars, Chicago	3.17	3.17	2.90	4.10
Iron bars, Philadelphia	3.73	3.73	3.685	4.935

	Prices Sept. 4, 1918	Average prices Aug., 1918	June, 1918	Sept., 1917
Iron bars, Cleveland	$3.64	3.64	3.64	4.50
Iron bars, Chicago mill	3.50	3.50	3.50	4.50
Beams, Chicago	3.27	3.27	3.00	4.46
Beams, Pittsburgh	3.00	3.00	3.00	3.75
Beams, Philadelphia	3.23	3.23	3.185	4.435
Tank plates, Pittsburgh	3.25	3.25	3.25	6.81
Tank plates, Chicago	3.52	3.52	3.25	7.33
Tank plates, Philadelphia	3.48	3.48	3.435	7.75
Sheets, blk., No. 28, Pitts.	5.00	5.00	5.00	8.75
Sheets, blue anld., No. 10, Pitts.	4.25	4.25	4.25	8.50
Sheets, galv., No. 28, Pitts.	6.25	6.25	6.25	9.68
Wire nails, Pittsburgh	3.50	3.50	3.50	4.00
Connellsville furnace coke	6.00	6.00	6.00	9.62
Connellsville foundry coke	7.00	7.00	7.00	12.50
Heavy melting steel, Pitts.	29.00	29.00	29.00	35.50
Heavy melting steel, eastern Pa.	28.50	28.50	28.50	31.25
Heavy melting steel, Chicago	29.00	29.00	29.00	32.63
No. 1 wrought, eastern Pa.	34.00	34.00	34.00	44.50
No. 1 wrought, Chicago	33.50	33.50	33.50	40.50
Rerolling rails, Chicago	34.00	34.00	34.00	41.23

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

(For Additional Prices See Page 586.)

Higher Prices Sought on Pig Iron

Certain Pittsburgh Interests Declare Present Costs Making It Impossible for Them to Operate—Difficulty in Getting Foundry Iron More Pronounced—Allocations Continue to Grow—Further 1919 Selling

Pittsburgh, Sept. 3.—Some merchant furnace operators in this district are insisting that the government should increase prices of pig iron for the last quarter, beginning Oct. 1. One producer, claiming that present prices are yielding no profit, is withholding the purchase of ore for delivery next year. Unless prices are increased, this interest says, after ore stocks on hand will be consumed, the government will be asked to take over the furnaces and operate them under its own supervision and it will not be asked to allow any profit to the owner. Makers claim that higher prices are necessary owing to the increases in wages, in the cost of material and in freight rates. They maintain that under present conditions there is no incentive to operate, but that if higher prices were allowed they would be in a position to buy equipment and make changes at their furnaces which would greatly increase their output. It is claimed that the merchant furnaces in this district at comparatively small cost could increase their production from 50 to 90 per cent. Practically all furnaces are getting sufficient supplies of coke but a great amount of fuel is not up to the standard in quality and this is causing a considerable loss of iron production. Some merchant furnaces report that they are losing 8 per cent or more in tonnage on this account. While inquiries for both steelmaking and foundry grades of iron still are coming to furnaces, they have fallen off by reason of the fact that melters are appealing more generally to the steel division for supplies and tonnages are moving forward today almost altogether through allocations. The Pennsylvania railroad today raised its embargo on shipments east of Pittsburgh.

More 1919 Iron Sold

Philadelphia, Sept. 3.—Sales of foundry iron for the first half of 1919 delivery has again featured the market in this district during the past week although the transactions have not been as numerous as in the preceding weeks. Eastern Pennsylvania, Alabama and Buffalo furnaces booked the business closed. All these furnaces now are practically out of the market. In most cases these sales were made to government consumers who apparently would encounter no difficulty in having iron allocated to them. The week's turnover included a good sized tonnage of off iron in the aggregate for nearby shipment all of which was offered by Alabama furnaces. Some criticism has been heard that many allocations are for immediate shipment although the certain consumers benefited have ample stocks and cannot use the iron for weeks to come. Several tonnages of low phosphorus were included in the week's allocations.

Couldn't Locate Tonnage

Buffalo, Sept. 3.—So busy were Buffalo furnaces on prior contracts that of the 30,000 tons, mostly of foundry iron, which was assigned for allocation to this district last week, the government representatives found it necessary to allot the most of it outside the district. About 10,000 tons of it is being placed in this district. The Donner Steel Co., which obtained permission to switch one furnace from foundry to malleable, will make the change within

the next ten days, it is said. The furnace to be switched will be one of two at Tonawanda. The other is on ferromanganese and the Buffalo pair are on basic. There has been no new booking of 1919 business. Consumers apparently assume that the value to be derived from placing their orders is more or less doubtful unless they are engaged on work urgently needed, in which case it is probable that the government will see to it that they get the necessary metal.

Difficult to Get Foundry

Cleveland, Sept. 3.—Growing difficulty of consumers of foundry iron to obtain their requirements is reflected in the increasing allocation being made for their account through the committee on pig iron, iron ore and lake transportation. This difficulty apparently is due to the changing over recently of various furnaces from foundry to basic iron. Distribution of foundry orders by the committee in the week totaled 27,000 tons. Other orders allocated by the committee during the week included 31,000 tons of basic, 10,000 of low phosphorus, 5000 tons of malleable and 1500 tons of bessemer, making a total of approximately 75,000 tons. This increases the total allocations in the four months since May to 834,000 tons. Requests upon the committee for iron are very numerous and are growing rapidly. About 100 requirements now are undergoing placement. Alabama furnaces continue to receive a liberal tonnage of basic orders, most of the lots placed in the week having gone there. Considerable iron for the first half of 1919 delivery continues to be sold to regular consumers doing war work by certain northern producers. One of the largest sellers in this district has amassed a large order book of this kind, although it has limited tonnages to a fraction of those asked by its regular trade. This interest still is selling.

Chicago Situation Quiet

Chicago, Sept. 3.—Trading in pig iron in the Chicago market is confined to booking a few small tonnages for delivery during the first half of 1919. This business is not of importance and most melters believe it is unnecessary to make contracts under present conditions. The government continues to allocate some tonnages of iron for manufacturers engaged on essentials who require prompt delivery and this tends to delay further delivery of iron on contracts made early in the year for delivery at this time. Southern producers are still out of the market for the most part and melters find it almost impossible to place business for first half. Deliveries from southern furnaces are much behind schedule and it does not appear probable that much progress can be made in catching up. A Jackson county producer of bessemer ferrosilicon recently opened his books and contracted as much of this alloy for first half delivery as he desires to sell at present. Although some producers of Lake Superior charcoal iron have already allotted their first half tonnage, it is believed some change may be made in the distribution and that the charcoal iron industry as a whole may divide the entire tonnage among users requiring this grade of iron rather than to follow the old plan of each producer caring for its own customers. Occasional cars of off iron, usually high sulphur, continue to be offered and these find ready sale.

Foundry Inquiry Growing

Cincinnati, Sept. 2.—The inquiry for foundry iron is growing. A number of melters who were formerly engaged in work that was considered non-essential have taken on contracts for machine tool castings and other work that is in line with the government's speeding up the war program. Although the inquiry has been urgent there has been no southern iron sold lately for last quarter shipment. Contracting for the first half of next year also appears to be at a standstill. There is also no swapping of iron among the foundries, as in ordinary times, and every melter is conserving every pound of metal to carry on the work in hand.

War Plants Get Iron

St. Louis, Sept. 3.—Plants in this district working on government contracts and essentials generally report satisfactory deliveries of pig iron. Receipts from the south are especially excellent, the car situation in that direction begin the best on months. The status of nonwar users has undergone no change other than to grow progressively difficult. One large plant engaged in the manufacture of specialties has cut its organization, and a number of others have plans for similar action. Stove manufacturers have been buying heavily in the scrap market, but that source of supply is getting as difficult as the pig iron market. Selling agencies are holding out no hope to the nonwar plants, and declare that as long as the war and present regulations of distribution obtain, they will be unable to offer a pound of free pig iron. Steel plants in the main have been working at capacity, the recent labor difficulties having been satisfactorily adjusted.

Doing the Best Possible

Birmingham, Ala., Sept. 3.—Furnace officials in the Birmingham district state they are doing the best possible in producing iron to meet essential demands. The output in this district shows a little improvement, but still is under the high water marks of last year. Reports persist of sales being made for delivery during the first half of the coming year, but outside of a little tonnage of off grades and to regular customers in small lots, comparatively speaking, no such bookings are being admitted by the furnaces. The production of basic iron on the British order allocated to this section by the government has been up to expectations. The tonnage for the first month under the contract is reported satisfactory, despite the amount turned down as not coming up to specifications. The railroad administration authorities here are given every preference possible in the handling of pig iron and as a consequence the make is being shipped out promptly. Accumulated stocks outside of the basic tonnage of the Tennessee Coal, Iron & Railroad Co. are still dwindling. Inquiries are so numerous that manufacturers are astounded at the amount of iron that is needed.

Lower Output

In Wrought Pipe Preventing Mills From Supplying Jobbers

Pittsburgh, Sept. 3.—Demand for greater tonnages of plates for the government has resulted in a heavier withdrawal of steel from pipe mills in consequence of which they have further curtailed their output. One prominent pipe maker in this district has a lap weld furnace down and is producing plates. Makers of both iron and steel pipe are heavily committed on essential requirements and are unable to accept any commercial business. Difficulty is being experienced by jobbers in getting sizable tonnages and some are unable to make anything like full replacements. Business coming under a higher classification prevents makers from taking these orders freely and the situation instead of becoming better will become worse in view of the reduction in the output of steel pipe.

The National Tube Co. has issued a card, effective Aug. 31, applicable to sales in the Texas and Louisiana fields which classifies such sizes of line pipe as are used for casings

and which are sold by the same method as are casings.

Want Preferred Listing

New York, Sept. 3.—Eastern makers of cast iron pipe are anxiously awaiting the issuance of the government's new list of preferred industries now being compiled. Makers of cast iron pipe hope to be included in the list. For several months they have been endeavoring to obtain a preferred listing, but so far have failed. At present they are devoting their production almost entirely to government work. The market at this time is devoid of features.

Sell For Essentials Only

Chicago, Sept. 3.—Selling of cast iron pipe is practically on a war basis, every sale, even to a city for an extension, passing the scrutiny of priority. Pipe makers can obtain pig iron for replacement only on a showing that previous supply has been used in an essential way. Bids will be opened at Madill, Okla., Sept. 4 on 200 tons. A letting for a small tonnage will be made shortly by Freeport, O., on figures opened Sept. 2. Ardmore, Okla., has placed 2500 tons of universal pipe with the Central Foundry Co.

New Orders

For Sheets Exceeds Shipments Because of Reduced Operations

Chicago, Sept. 3.—Plate mill operation is about two-thirds of capacity, with output running steadily. Demand is restriced by large needs for war work and even in this line it is difficult to get out tonnage for jobbers in accordrance with their priority classification. Outside users are not seeking supplies as they realize the futility of asking.

Orders Exceed Shipments

Pittsburgh, Sept. 3.—Orders from the government for sheets exceed shipments. Operations are devoted almost altogether to government work and continue to be curtailed greatly owing to the shortage of sheet bars. It is estimated that the output is about 60 per cent of capacity with a tendency downward rather than upward. Sheet mills were down on Labor day.

The Simplex Mfg. Co., 1360 North Wells street, has been organized to manufacture safety garments for workers in foundries, steel plants and similar work. E. S. Mead is president, E. W. Uhleman, vice president, and Beecher Frank, secretary

Coke Supply Meets Needs

Cooler Weather and Diligent Labor Increase Production—Quality of Product Causing Complaint—Coal for Frick Ovens Still Sought

Pittsburgh, Sept. 3.—Improvement was reflected during the past week in the supply of coke from the Connellsville region. Cooler weather has been an aid toward increased production. Laborers are, for the most part, remaining steadfastly at work, and continued at their tasks on Labor day. The chief difficulty is due to the quality of coke, which still is below standard and is causing considerable loss of pig iron tonnage. The car supply is ample. No free offerings are available. When any tonnages are produced in excess of contract obligations, they are immediately taken over under the direction of the fuel administration and allocated to furnaces needing them most. Nothing has developed with regard to the report that the production of foundry coke may be cut down and substituted with 48-hour fuel. This is being urged strongly by some blast furnace interests. Plans still are under way, it is understood, to find coal for the by-products ovens of the Carnegie Steel Co. at Clairton, Pa., to take place of that they are now receiving in the form of diverted fuel which formerly was consumed by the 3300 beehive ovens of the Frick Coke Co., in the Connellsville region, which were recently blown out. This represents approximately 25 per cent of the beehive ovens the company has, the remaining ones remaining in active operation If the 3300 are blown in again, as proposed by the fuel administration, they will require the coal now being shipped to the Clairton plant, which gets most of its coal from the Gates mines in the lower Connellsville region. Production for the week ended Aug. 24 totaled 337,705 tons as compared with 326,610 tons for the preceding week, according to *The Connellsville Courier*.

Local Output At Record

St. Louis, Sept. 3.—Production by the by-product ovens in this district during August, according to early estimates, is likely to set a new record. Conditions of labor have been the best this year, despite the intensely hot weather, and the coal movement was somewhat better than normal. Receipts of metallurgical coke from the Connellsville and Virginia districts was heavy, so that on the whole the situation is all that could be expected under the circumstances. The general demand still far exceeds supplies available, especially of foundry coke, but essential plants are getting all the fuel they can use currently, with some small accumulations in isolated instances.

Busy In Dodging Orders

Cincinnati, Sept. 2.—Heretofore, according to coke sellers the beginning of September was always a very busy time. It is today but the busy part of it now is to "side-step" orders, and this applies to both furnace and foundry coke. Coke is moving from all fields more promptly as weather conditions have tended to help out production. Some complaint is registered as to shipments from the New River district, but as little of this coke is used around here the delays in forwarding the fuel will not cause any appreciable trouble.

Closely Watching Production

Birmingham, Ala., Sept. 3.—Coke production in Alabama is being closely watched by producers and the effort is being made to get out every ton possible. The statement is repeated that every ton of coke that can possibly be produced is needed. Coal production shows some increase again. For the week ending Aug. 24, according to figures given out by the representatives of the federal fuel administrator, Alabama produced 430,311 tons of coal, against 411,035 tons for the week ending Aug. 17, 427,718 tons for the week ending Aug. 10 and 417,462 tons for the week ending Aug. 3. There was no cessation of work on Labor Day, and the expectations are that for the weeks ending Aug. 31 and Sept. 7 there will be increases shown, though car shortage caused some shut downs at mines in the district. A little coke is still being shipped from this district to Mexico and the far west for smelting purposes.

Addresses Foundrymen

Maj. W. A. Garrett of the Remington Arms Co., addressed the Philadelphia Foundrymen's association at the Manufacturers' club, that city, Sept. 4. Major Garrett talked largely about the drive on the Somme in which he participated. C. K. West, district manager of the General Electric Co., Philadelphia, and G. S. Coppage, manager of the Pusey & Jones Co., Wilmington, Del., have been elected members of the Philadelphia Foundrymen's association.

Scrap Sales Are Restricted

Shortage of Supplies Continues to Retard Trading—Reserves Not Being Provided—New Ruling is Awaited

FOR COMPLETE SCRAP PRICES SEE PAGE 586

Chicago, Sept. 3.—Shortage of scrap is not being relieved and dealers find the volume of trade much diminished. Steel grades are especially scarce and large consumers are open for all tonnages that may become available. Up to this time no distress has resulted from the shortage but no reserves for winter are being laid up and only old reserves remain in mill yards. Rolling mill grades have taken a new lease of life as the result of better buying of bar iron and this form of scrap is moving in much better volume. Re-rolling rails are available only occasionally in small lots. Cast was in better demand recently, as pig iron is more difficult to obtain and foundries are turning more to scrap. The supply is ample for all needs so far. The Chicago & North-Western is offering 3900 tons, including 250 tons of steel rails and 600 tons of mixed steel and wrought. The Santa Fe offers 1455 tons.

Holidays Restrict Market

New York, Sept. 3.—With the observance of the holiday yesterday, trading in the New York scrap market has been somewhat retarded and will be slowed up still further by a Jewish holiday at the end of this week. A good demand for all grades of scrap continues. Some dealers have standing orders for all the material they have to offer. Inquiry for steel and cast scrap remains especially strong. Dealers state that the transportation service is now the best in many months, but that the movement of scrap is not reflecting this condition due to the severe shortage of labor in the yards. Prices are holding firm at the government maximum.

Embargo Helps Mills

Philadelphia, Sept. 3.—A marked improvement in the position of eastern iron and steel mills as to their supply of scrap turnings has been brought about by the 30-day embargo against the shipment of this grade to blast furnaces. These consumers have been able to buy large tonnages which otherwise would have gone to the furnaces. Some turnings which are unsuitable for mill use are being shipped to the furnaces on permits from the subcommittee on scrap. A few dealers who attempted to ship turnings of the latter character without permits are not meeting with much success since the furnaces all are pledged not to accept such deliveries unless they have the express approval of the scrap committee. An active demand for all grades of scrap continues.

Labor Situation Improved

Pittsburgh, Sept. 3.—Scrap dealers report a slight improvement in the labor situation, and as a result better headway is being made in assorting tonnages received at their yards. Stocks of some dealers are almost entirely depleted and others report that they are obligated for every pound they have on hand, while difficulty is being met in replacing tonnages. Consumers would be glad to get large tonnages of all the leading grades but have had to resort to other kinds of scrap which ordinarily they would not consume. Increased production of shell steel, promises to give considerable relief in the way of supplying greater tonnages of turnings and of discard steel. Comparatively small shipments from outside districts are being made to this territory. Some dealers in eastern Pennsylvania who supplied scrap for this district before the permit system went into effect, continue to make these deliveries.

Expect New Regulation

Buffalo, Sept. 3.—The scrap trade can prepare itself for another important government order in the near future. Though those persons who are familiar with its nature are holding the information as confidential from the government, it is said that the new development will be along the lines of the recent turnings and low phosphorus regulations by the government and decidedly more sweeping. It is believed that the order prohibiting the selling of "unguaranteed low phos" will be effective within the next ten days or two weeks in augmenting the supply of heavy melting steel in this district. The demand for all grades continues strong, with a scarcity of practically everything on the list.

Can't Get Shipping Permits

Cleveland, Sept. 3.—Labor shortage and the worst railroad car service in weeks are combining to deaden the scrap iron and steel market here. Permits for shipments through Pittsburgh are said to be almost impossible to get, and repeated requests for them by some scrap interests here have been refused on the ground that the Pittsburgh gateway just now is choked. Labor scarcity, which long has been affecting yards here, has become more pronounced the past few days, and some dealers are complaining of poor deliveries. Yards are fairly-well stocked with mixed scrap iron and steel and in some cases are said to have been compelled to turn down offers. The demand for heavy melting steel is unabated. Supplies continue far under requirements. Permits for shipments under the 30-day restricted period are said to be slow in coming through.

Sellers Want Maximum

Cincinnati, Sept. 2.—It is reported some sellers of scrap are insisting on getting the full maximum price, leaving the dealer only his small margin in the way of commission. One dealer states that this is an impossible proposition because the scrap has to be delivered at consumers' plants, and that the cost of sorting it represents more than the average melter imagines. No changes have been made in any quotations, but all grades are strong.

Values Are Climbing

St. Louis, Sept. 3.—The demand for all grades of scrap iron and steel continues well in excess of supplies, and the trend of values is upward, with more and more grades reaching the government maximum. Consumers' and yard stocks are unusually low for this time of year, and very little material is coming into sight. Aside from a small list by the St. Louis Terminal association, there were no railroad offerings before the market this week. Steel is in especially urgent demand, and anything which can be melted by stovemakers is snapped up the minute it appears. Rolling mill grades are wanted, but dealers have had little in this line to dispose of. Heavy tonnages of relaying rails could be placed overnight were they available.

South Selling More Scrap

Birmingham, Ala., Sept. 3.—Yards of dealers in scrap iron and steel in the south are beginning to show a decline. There is a scarcity of cast grades. No. 1 wrought, too, is in strong demand. Local consumers continue to refuse to pay the government maximum prices except to deduct what they think is the difference in freight rates. There is still a need for a large quantity of heavy melting steel. Quotations remain

about the same, though conservative figures are given. One of the larger consumers of wrought tells of paying $32 for this product, while the maximum in the schedule given out by the dealers is around $30.

More Inquiry

For Ferroalloys Appears In Pittsburgh Market—Other Districts Quiet

Pittsburgh, Sept. 3.—Inquiries for ferromanganese and spiegeleisen are more numerous and include a few fairly large tonnages. A middle western consumer is in the market for 1000 tons of 70 per cent ferromanganese, shipments to start immediately and to continue over the first half of next year. There also is an inquiry for 750 tons of this alloy and another consumer wants 600 tons, deliveries in both cases to run over the remainder of this year and into the first half of 1919. Several smaller inquiries also have come out recently. A lot of 5000 tons of 40 per cent spiegeleisen for delivery over the rest of this year and the first half of 1919 is being sought. It is some time since this grade was sold and it is nominally quoted from $3.50 to $4 per unit, furnace. Small lots of 16 per cent spiegeleisen, which are quoted at $75, furnace, for spot or on contract, are changing hands. An inquiry is out for 350 tons of 50 per cent ferrosilicon for the first half of 1919.

Buyers are Covered

Philadelphia, Sept. 3.—Little activity is being displayed in ferromanganese or spiegeleisen. Most consumers are well covered ahead as result of orders placed during the recent buying movement.

No Rush For Ferromanganese

Chicago, Sept. 3.—Although some slight selling of ferromanganese for first half delivery is being done, no real buying movement has developed and consumers seem contented to let the matter rest for the present. The local maker has a small tonnage remaining for delivery this year and has booked some contracts for first half. One reason for buyers not showing anxiety to cover their requirements is the fact that British metal has been released recently, applying on old contracts at low prices and the possibility exists that further release may be made later.

The Burnside Steel Co., Chicago, has placed a contract with the Kenwood Bridge Co. for a one-story brick and steel foundry, 50 x 100 feet, to cost $30,000.

Ingots Are Being Offered

Stricter Policy in Granting Export Licenses Frees Some Steel—Tightness in Billet and Slab Supply More Severe

Philadelphia, Sept. 3.—Some ingot tonnage has become available on the market as a result of the stricter policy of the government in granting licenses for products of iron and steel. The tighter rein on exports arises from the effort to conserve tonnage wherever possible. The mills now are being refused export licenses which have been had with ease only recently. As a result, certain products for export cannot be rolled. The ingot tonnage thus freed, can be readily disposed of in the east since slabs and billets are the forms most wanted.

Expect Only Small Demand

Pittsburgh, Sept. 3.—The war industries board having agreed to permit manufacturers of passenger automobiles to round out inventories they have on hand, it is expected that the latter soon will put out inquiries for tonnages of hot and cold rolled strip steel. The demand, however, is expected to be light. The understanding here is that the automobile companies are expected to do a great deal of exchanging of tonnages among themselves before asking the steel manufacturers for supplies. Producers are so heavily engaged on government work that it is doubtful if they can furnish much tonnage for passenger automobile manufacture. Moreover the output of hot and cold mills has been curtailed further and now is estimated at between 50 and 60 per cent of capacity. Automobile makers have a large amount of business held up because of their inability to secure steel. One case is reported where a Detroit manufacturer recently sought a tonnage of steel to the value of only $7500 which would permit the instant completion of automobiles to the value of about $1,500,000. So far this tonnage has not been supplied.

Shortage More Acute

Pittsburgh, Sept. 3.—The shortage of billets and sheet bars which has been serious for a long time has become more acute. Growing demands of the government plainly indicate that some important lines which have been getting adequate or at least fair sized tonnages will have their allotments reduced. The embargo on Youngstown mills against making shipments into this district remains in effect and by some it is believed to be merely a forerunner of other shipments of steel from one district restrictions that will be placed on to another. Bessemer steel now is practically as scarce as open hearth steel. Large tonnages of the former are used to produce plates in connection with the car building program. Wire rods also are extremely scarce.

Demand Is Strong

Pittsburgh, Sept. 3.—Demand for the larger sizes of cold rolled shafting is strong, and is exclusively for direct and indirect government requirements. Shortage of steel has greatly curtailed operations and the average deliveries are made in from four to five months, while tonnages taken under priority A classification cannot be shipped under 90 days. Demand for the smaller sizes considerably exceeds output.

Rail Orders Not Placed

Pittsburgh, Sept. 3.—Nothing new has developed in connection with the placing of orders for the standard steel rails that are needed for the roads now operated by the railroad administration. A good demand exists for small spikes, which are wanted in connection with coal mining operations and which are largely distributed through jobbers. The latter, however, are not having their orders fully met as production of some mills is on a scale that makes apportioning necessary in order that all may get some deliveries. It is understood that the fuel administration will make an effort to secure a larger output of small spikes for new mines to be opened and developed in order to bring up the coal production.

To Weigh War Problems

The National Implement and Vehicle association will hold its twenty-fifth annual convention at the Congress hotel in Chicago, Oct. 16-18. It will be a war convention and the subjects affecting the industry will be foremost in the discussions. The principal subjects for discussion will be materials, labor, eliminations, government license transportation and the relations of manufacturer to the retail dealer. Addresses will be made by men well informed on the various subjects, including several Washington officials.

Bar Production Reduced

Diversion of Steel Cuts Output Greatly—Shipments for Pleasure Automobiles Refused—Implement Concession Put on Shelf

Pittsburgh, Sept. 3.—Merchant bar mills are diverting greater tonnages of steel to increase the production of shell rounds and plates and operations now are estimated at about 50 per cent of capacity or less. Their output is devoted altogether to essential purposes and no other business is entertained. Some makers still have bookings, which were made as far back as December, 1916, and the prospects are that some of them never will be filled. They represented important commitments at that time, but under present conditions are given no rating at all. The question of making a concession of $5 a ton to implement manufacturers still is held in abeyance. Division of sentiment is found in the trade as to whether or not it will be made, with perhaps the belief predominating that it will be granted. Sentiment against showing favoritism to this class of consumers, who take not more than 1 per cent of the steel output, has grown greatly and if the concession is made, some manufacturers will yield to it only through the leadership of others. Demand for iron bars is fair, but has fallen off somewhat.

Automobile Shipments Stopped

Cleveland, Sept. 3.—Restrictions on shipments of steel to the builders of passenger automobiles are now in force. The mills, acting in accordance with instructions from the steel director, will not accept orders of this kind unless they have a priority standing or are covered by a special permit. This latter is to be procured from the steel director by the consumer. Instructions have been received by producers of reinforcing bars that henceforth such sections must be rolled from shell steel discards. No soft steel discards may be used for reinforcing bars according to instructions from the government steel authorities. Nothing further has developed regarding the proposed concession on bars and other steel to the implement manufacturers.

Quiet on Bar Concession

Chicago, Sept. 3.—Apparently the proposed concession to agricultural implement manufacturers of $5 per ton is being allowed to drop from sight for the present in view of the publicity that has been given it. At present the situation appears to be that steelmakers are willing to book agricultural bars on the basis of present prices with the proviso that the price will be reduced if the agreement goes through. It is understood business is being taken at present on this basis. The date of making an agreement later will not be important as the price will apply from July 1 if it is made at all. Diversion of ingots from bar mills to rail mills to supply the demand for rails for the military railroad in France is causing a shortage in production of bars. This is being done since it is impossible to lessen output of plates, which are deemed of prime importance.

Bar iron makers find demand is increasing steadily, the slight buying movement that started a fortnight ago having continued with increasing volume of orders being booked. This arm of the industry now is in much better position than for several months. Export demand also continues to furnish tonnage.

No change has taken place in the situation as to hard steel bars rerolled from rails, the latter being so scarce that the output is much restricted and many inquiries are turned away as a result.

Bolt Demand Heavy

Chicago, Sept. 3.—Bolt and nut manufacturers find present business on their books sufficiently heavy to cause them to refuse many inquiries. They have sufficient orders to keep them fully occupied far into the future and find it inexpedient to assume further obligations before they have opportunity to clear books somewhat. One of the mysteries of the trade is the apparent disappearance of the government's "hurry-up" inquiry of a few months ago for more than 100,000,000 bolts, which seems to have evaporated.

Subsidiary Order Rating Remains in Doubt

Conflicting opinions still leave in doubt the application to subsidiary contracts of the automatic priority of A-5 allowed to work for the army and navy departments and the Emergency Fleet corporation under Section 7 of circular No. 4 issued by the priority board. The first interpretation of this section was that subsidiary contracts could not acquire the same automatic rating as the principal contract, subsequently some of the mills received through representatives of the government, a ruling that the rating of the principal contract could be applied to subsidiary contracts by the subcontractor making an affidavit that he would use for the specific government contracts and no other, the material which he requested, and by this rating receiving the indorsement of the government official who indorsed the original A-5 rating. This interpretation was reported in THE IRON TRADE REVIEW in its Aug. 29 issue. This week, a later report shows that this ruling is not conclusive and that the point remains under consideration by the priority authorities. The inference is strengthened that the original understanding now holds to the effect that the A-5 rating does not apply and that subsidiary contracts must be treated individually. It is pointed out that many of these, by their purpose, will take an automatic priority of their own under section 8 of circular No. 4 which lists various lines of product as entitled to different ratings. For example, a turbine for a ship for the Emergency Fleet would take an automatic A-5 rating under section 7, but the steel or other material going into the turbine would receive A-4 under section 8.

Heavy Orders

For Wire Products are Allocated—Output on Decline

Pittsburgh, Sept. 3.—Government requirements of wire products continue heavy and with mill operations not much better than 50 per cent of capacity, owing to the scarcity of steel and the demands of the war industries board that wire production be curtailed further to release steel for rails, plates and projectiles, manufacturers are not able to any more than meet essential requirements. Allocations of 21,000 tons of plain wire for shipment to France have been distributed and Pittsburgh manufacturers have received their share. Allocations of 56,000 tons of barbed wire, 34,000 tons of which are for the war department and 22,000 tons for export to France, have been made and a good portion has come to manufacturers here. Jobbers' replacement orders are only partially filled, if at all, so much of the production is required on direct war orders. Shell discards are being used to some extent in making wire and large nails, but this material is hard and as it requires two annealings to be workable, it cannot be said to hold out much promise as a means of sustaining wire production. It is

intimated that wire mill operations will eventually decline to 25 per cent of capacity, because of the diversion of steel from wire to what are considered more vitally essential products.

May Cancel Orders

Cleveland, Sept. 3.—In view of the reduced output of the wire mills due to the diversion of raw steel elsewhere, some of the independent makers find themselves in position of being unable to make any definite promises of delivery. Accordingly they are giving all customers with unfilled orders upon their books an opportunity to cancel. This does not apply to the railroads or to orders covered by priority certificates.

Labor Matters Considered at Steel Meeting

The problem of obtaining and maintaining maximum production of iron and steel was discussed at length at a meeting held in the Waldorf-Astoria hotel, New York, Aug. 28, following the conference held in Washington the preceding week with J. Leonard Replogle. The meeting, which was attended by more than 100 of the country's leading producers, was devoted chiefly to the discussion of the roles played by transportation and particularly by labor, in achieving a maximum output. The subjects of the extent of the labor supply, the morale, and the prevailing wages, were gone into thoroughly. At the conclusion of the meeting, Judge Gary, who presided, dictated the following statement:

The iron and steel meeting today was attended by representatives of all the principal manufacturing concerns of the industry. There was considered the question of securing the largest possible production of steel for military necessities. With other matters, were discussed various labor problems.

After careful deliberation, the whole subject matter, by unanimous vote, was referred with power to a committee composed of the members of the present general committee of the American Iron and Steel institute, as follows: Elbert H. Gary, chairman; J. A. Farrell, E. A. S. Clarke, C. M. Schwab, J. A. Topping, E. G. Grace, Willis L. King, J. A. Burden, J. A. Campbell, A. C. Dinkey, L. E. Block, H. G. Dalton and A. F. Huston.

Judge Gary declined to name the specific labor matters which were taken up.

Makers of refrigerators have been asked by the war industries board to discontinue the use of pure tin in tinning shelves and to substitute an alloy containing not more than 60 per cent tin.

Plate Mills Over the Top

Liberal Supply of Steel Enables Them to Exceed Rated Capacity—More Locomotive Tonnage Placed With Producers

Chicago, Sept. 3.—Plate mills are being supplied all the ingots they can transform into finished material and no shortage of steel is allowed to interfere with this branch of production. Production of plates is greater than rated capacity in many instances. Government allocations recently have been for small lots, without important tonnages, though the aggregate is equal to present production, giving mills no opportunity to catch up on orders. Since the government need is greater than mill capacity it is practically impossible to supply others with material. While this situation exists steelmakers observe a tremendous tonnage has been damned up, which will come forth at the end of present conditions and furnish heavy business for a long time after actual war needs have passed.

Locomotive Tonnages Placed

Philadelphia, Sept. 3.—Large tonnages of plates for locomotive building continue to be distributed among the mills. Further allocations of this kind are in sight since additional orders for locomotives have been placed with the Baldwin Locomotive Works, the American Locomotive Co. and the Vulcan Iron Works. These will call for a large tonnage. Eastern mills expect that further lots of car plates will be distributed shortly.

Production Is Increasing

Pittsburgh, Sept. 3.—Production of plates is being increased as a result of the fact that greater tonnages of ingot steel are being diverted to this purpose and because some additional capacity is being utilized. The greatest demand comes from shipyards, with the next heaviest being for cars. Of the 20,000 high and low side gondola cars recently distributed among makers, the Standard Steel Car Co. was awarded 4500 high side and 1000 low side gondolas, calling for 55,000 tons of steel. The Pressed Steel Car Co. was awarded 2300 high side and 500 low side gondolas, requiring 28,000 tons of steel. The latter company also has been awarded 25 hopper cars for the Monongahela Connecting railroad, a subsidiary of the Jones & Laughlin Steel Co.

At a meeting of the advisory committee of the Youngstown, O., community labor board, representing manufacturers of Mahoning, Trumbull and Ashtabula counties, Thomas McDonald, of the Carnegie Steel Co., declined appointment as manufacturers' representative on the board, owing to the urgency of the company's business.

High Rate

Of Tin Plate Production Due To Liberal Steel Supplies

Pittsburgh, Sept. 3.—Tin plate mills are operating at about 95 per cent or more of capacity and continue to receive adequate supplies of sheet bars. The output is meeting the demands for food containers. The war industries board is said to have under consideration the cutting down of supplies of sheet bars for tin plate mills, but in the event this is done producers declare the demands for tin plate next spring, which ordinarily are produced during the winter months, probably cannot be met fully. Cooler weather has been an aid in increasing the output which was affected during a portion of August by reason of the high temperature. The curtailment, however, apparently was not so great as it was feared it would be and is said to have been only about 10 per cent under the production of July, when 3,110,000 boxes were turned out. Tin plate mills were shut down on Labor day.

May Reduce Jobbers

Chicago, Sept. 3.—While it seems like drastic treatment, it is said that a plan is under consideration for reducing the number of jobbers eligible to receive steel material from mills, in the interest of conservation of supply. The plan is understood to purpose appointing one official supply warehouse in important jobbing centers in place of the four to a dozen now existing. In this way stocks will be smaller in the aggregate but assortments better supplied and buyers can obtain service more readily. Just how this can be worked out is the difficulty and the plan may be found impossible of application.

The war industries board is proposing to standardize shoe cartons.

Gun Plant Steel Placed

American Bridge Co. Allotted 80,000 Tons for Neville Island Works —Makers Won't Sell Building Shapes Without Permit

New York, Sept. 3.—Fabricated steel requirements for the construction of the ordnance plant of the government at Neville island now are definitely placed at 80,000 tons. This tonnage will be supplied by the American Bridge Co. with which allocations for the material have been placed. Developments in the structural situation in this district have been without important feature. All the work being placed is related directly or indirectly to war needs.

The allotment of the remaining 8000 tons for the two government explosives plants to be erected in Ohio by the Air Nitrates corp., New York City, continues the only sizable business pending. Railroad demand is relatively quiet, and with the exception of the Pennsylvania's inquiry for 1100 for a bridge at Clarion, Pa., and 600 to 700 tons for several small jobs, little is pending.

Ships Get Material

Pittsburgh, Sept. 3.—More than half of the current output of fabricated steel is being taken by the Emergency Fleet corporation for yards and ships and as a result, deliveries to other purposes, even of an essential character, are irregular and unsatisfactory. Private business continues limited.

Can't Accept B Orders

Buffalo, Sept. 3.—Sales agencies say that orders on bars and structural material carrying priority rating as high as class B2 have to be declined. A large producing interest states its production has fallen below 40 per cent of what it anticipated through urgent government requirements and it is therefore unable to entertain commercial orders even for replacement of jobbers' stocks. Governmental demand for shipbuilding and railroad material is cutting most seriously into the commercial production.

Must Get Permit

Cleveland, Sept. 31.—Every owner contemplating erecting a building must obtain express permit through the steel director and the war industries board, the mills have been advised. This permit covers not only steel, but cement, lumber, labor, etc. Accordingly sellers of shapes will not deal with a buyer unless the latter can furnish such a permit. A lot of 5500 tons of shapes and bars for boats to be built by the Toledo Shipbuilding Co. is to be purchased direct of a Pittsburgh independent mill by the Emergency Fleet corporation and is not to be allocated to the latter as originally believed.

Proceed With Bridge Work

Chicago, Sept. 3.—Determination to proceed with the improvement of Michigan boulevard at the crossing of Chicago river, in spite of present costs of steel and its needs for war purposes is evidenced by the city's taking bids on 2356 tons for a portion of the work, leaving the remainder for a later date. The Denver & Rio Grande railroad has placed 1050 tons with the Virginia Bridge & Iron Co. for eight riveted truss bridges.

CONTRACTS AWARDED

Eight riveted truss spans for Denver & Rio Grande railroad, 1050 tons, to Virginia Bridge & Iron Co.

Pier No. 15, Hudson river, New York City, 480 tons to the McClintic-Marshall Co.

Two buildings for the Macbeth-Evans Glass Co., Pittsburgh, 250 tons to the McClintic-Marshall Co.

Boiler house, Consolidated Electric Light & Power Co., 600 to 700 tons to Chesapeake Iron Works.

Concentrating plant, Phelps, Dodge & Co., Bisbee, Ariz., 1600 tons.

CONTRACTS PENDING

North approach Michigan boulevard bridge, Chicago, 2131 tons, bids being taken.

Sidewalk supports south approach Michigan boulevard bridge, Chicago, 225 tons, bids being taken.

Machine shop, Mare Island navy yard, California; 1000 tons, bids extended to Sept. 3; 6200 tons for structural shop also pending.

Pennsylvania railroad, 1100 tons for bridge at Clarion, Pa., and 600 to 700 other miscellaneous work.

Government shed, New Orleans, 100 tons.

Sound Thinking

Needed to Redeem Trade Commission Says Chamber of Commerce

Washington, Sept. 3.—In a severe arraignment of the federal trade commission, which recentlly published reports on alleged profiteering in the steel industry, in the meat packing trade and in other large businesses, the chamber of commerce of the United States has submitted to President Wilson a full report showing how the policy of the commission has degenerated and pointing out how the commission may be brought back to enjoy the full confidence and support of the industries of the country. The report was submitted at the White House, Aug. 19, but aside from Secretary Tumulty's acknowledgment of it, the chamber has received no word of its reception.

The report was sent to the President, according to Secretary Goodwin of the chamber, only after the chamber's federal trade committee had gone before the trade commission and stated the results of long study and investigation. The committee's report, endorsed fully by the chamber directors, is said to embody a thorough search of all public statements of the commission and careful comparison with the statement of the President to congress when he urged its creation and with the law and testimony taken preliminary to passage of the measure creating the commission. The committee which made the report was organized about the time of the commission inauguration and has followed the commission through its entire career.

The commission, when met by the chamber's committee, evidently declined to accept the suggestions. Hence the chamber report was made. The chamber's letter to the President states fully the situation concerning the personnel of the commission. It mentions no names but refers to the incumbency of William B. Colver, chairman, and Victor Murdock and J. F. Fort, and to the vacancies created in the resignation of Joseph E. Davies and William J. Harris. Davies and Harris quit to win political honors. Davies was defeated for the senatorship from Wisconsin and Harris is in a similar campaign in Georgia. Francis J. Heney, special counsel, drawing $30,000 a year, also resigned and recently was defeated in a political campaign in California.

Appointment of two "men whose training, temperament, experience and reputation for sound judgment qualify them for the positions" is urged of the President.

Plate Output Good

Philadephia, Sept. 4. — Pittsburgh sheared and universal plate produced by the Carnegie Steel Co. in August totaled 11,539 tons as compared with 122,979 tons for July and 116,417 tons for June. The greatest tonnage ever turned out by the Carnegie company in any single month was in May of the current year when the total was 125,480 tons. The 110-inch liberty mill of the Homestead Works produced 17,526 tons in August as compared with 17,687 tons in July.

Pig Iron Output Drops Slightly

Production in August Shows Small Decrease From Previous Month—High Level of Output Maintained—More Stacks Are Relighted and Record Number of Furnaces Are Now Active

Pig iron production in August fell off slightly from the July figure, but continues at the generally high level which has prevailed for the past six months. Coke shortage caused the banking of some furnaces.

The total output of coke and anthracite pig iron in August was 3,392,576 tons against 3,408,584 tons in July, a loss of 16,008 tons. The daily average figure dropped to 109,438 tons in August from 109,954 tons in July. The steel works or nonmerchant furnaces suffered a slight loss in output for the month, their August total being 2,523,425 tons against 2,549,660 tons in July, a decrease of 26,235 tons. The output of merchant iron last month was 799,547 tons against 803,520 tons in July, a loss of 3973 tons.

The number of active stacks continues to mount, 370 furnaces being in blast on the last day of August compared with 364 on July 31. This total is well above any record set since the American pig iron industry has operated under modern conditions. Merchant furnaces in blast increased by 5 last month, 11 relighting and 6 blowing out.

Three steel works furnaces were blown in and two blown out, a net gain of one.

The August production of spiegeleisen was 33,804 tons against 21,766 tons in July, a gain of 12,038 tons. Ferro output last month was 35,800 tons compared with 33,638 tons in July, a gain of 2162 tons.

MONTHLY PRODUCTION

	1918	1917	1916
January	2,403,227	3,159,839	3,171,878
February	2,318,242	2,649,935	3,078,548
March	3,209,996	3,255,813	3,327,630
April	3,273,355	3,328,061	3,225,496
May	3,451,884	3,413,677	3,364,584
June	3,316,148	3,260,234	3,213,818
Total 1st half	17,972,852	19,067,559	19,381,954
July	3,408,584	3,337,442	3,221,127
August	3,392,576	3,238,970	3,197,838
Total 8 mos.	24,774,012	25,643,971	25,800,919
September		3,140,742	3,208,041
October		3,296,286	3,508,180
November		3,198,597	3,317,805
December		2,885,380	3,184,178
Total 2d half		19,097,417	19,637,169
Grand total	24,774,012	38,164,976	39,019,123

Unfilled Orders Large

Unfilled orders to a value of approximatelly $4,000,000 were shown to be on the books of the Page Steel & Wire Co., Pittsburgh, at its annual meeting, held at Jersey City, N. J., Aug. 28. For the year ended June 30, the net profits were $420,555. Dividends were declared out of the profits for the half-year period ended June 30, as follows: $3.00 per share on first preferred stock and $3.50 per share on the sceond preferred stock, payable Oct. 31, to stockholders of record Oct. 15.

The following officers were re-elected: B. Lissberger, president; Arthur A. Clement and Joseph N. Podrasnik, vice president; Arthur B. Cody, secretary; John E. Carr, treasurer and assistant secretary; Joseph N. Podrasnik, assistant treasurer; E. C. Sattley, general manager. In addition to the officers, the following will serve as directors: Charles M. Lamb, Homer O. Page, George L. Bennett, Allan M. Clement, Alois Podrasnik, Leslie B. Robertson and Norman Bridge.

AVERAGE DAILY PRODUCTION

	1918	1917	1916	1915	1914
Jan.	77,523	101,930	102,319	51,323	60,624
Feb.	82,794	94,641	106,157	59,521	67,450
Mar.	103,548	105,026	107,343	66,009	75,534
Apr.	109,112	110,936	107,517	70,484	75,383
May	111,351	110,119	108,535	72,747	67,646
June	110,538	108,675	107,127	78,998	63,486
July	109,954	107,659	103,907	82,687	63,075
Aug.	109,438	104,483	103,156	89,510	64,403
Sept.	.....	104,691	106,935	94,478	62,757
Oct.	.....	106,332	113,167	100,656	57,007
Nov.	.....	106,620	110,593	101,174	50,042
Dec.	.....	93,077	102,715	103,278	48,236
Avg.	101,951	104,562	106,610	81,022	62,934

Ore Shipments

Ore shipments from upper lake ports for the month of August totaled 9,725,331 tons against 10,659,203 tons in July, a decrease of 933,872 tons. Shipments in July had been the greatest for any month. Heavier coal and grain shipments and a dock strike at Superior held down the August total.

The total amount of ore shipped to Sept. 1 is 39,334,264 tons. The total shipped to Sept. 1 of last year was 39, 221,149, the figures for this year exceeding those for the same period in 1917 by 113,015 tons. The following table shows the amount of ore shipped from upper lake ports and the total shipment from each port to Sept. 1.

	August.	To Sept. 1.
Escanaba	1,168,604	4,011,481
Marquette	592,073	2,276,092
Ashland	1,209,394	4,582,950
Two Harbors	1,364,765	6,109,356
Duluth	3,243,806	13,156,893
Superior	2,146,689	9,197,933
Totals	9,725,331	39,334,264

Four hundred employes of the Stamford rolling mills on Aug. 30 sent a cablegram to Marshal Foch, commander-in-chief of the allied armies, saying that they had voted to work on Labor day, and that they would do their part to secure 100 per cent production of military requirements.

AUGUST PIG IRON

States	No. of stacks.	No. in blast last day of month. Aug.	July	Total tonnage made. Merchant	Non-merchant	——Totals—— Aug.	July
Pennsylvania	161	142	141	241,702	1,071,969	1,313,671	1,320,946
Ohio	79	75	71	148,162	611,741	759,903	745,696
Alabama	47	33	31	112,357	97,582	209,939	200,146
Virginia	21	14	13	33,790	.....	33,790	34,972
New York	29	26	25	77,126	139,465	216,591	224,577
New Jersey	5	4	5	15,822	.....	15,822	25,251
Illinois	25	23	24	68,405	253,413	321,818	334,547
Colorado	6	4	4				
Indiana	15	14	15	29,805	292,672	322,477	326,916
Maryland	4	4	4				
Wisconsin	6	4	4				
Kentucky	7	5	5				
West Virginia	4	4	4	39,932	40,975	80,907	79,463
Tennessee	17	10	10				
Washington	1	1	1				
Georgia	2	0	0				
Texas	3	0	0				
Minnesota	3	3	3	32,336	15,608	48,054	60,666
Michigan	3	3	3				
Missouri	1	1	1				
Spiegel—all states	..	..	..	.....	.....	33,804	21,766
Ferro—all states	..	..	..	.....	.....	35,800	33,638
Totals	439	370	364	799,547	2,523,425	3,392,576	3,408,584

Malleable Industry on War Basis

War Service Committee Chosen at General New York Meeting to Effect Closer Contact of Whole Industry With Government—Semisteel Shell Program is Outlined—Price List for Third Quarter Shown

MALLEABLE casting manufacturers of the United States, at an important meeting at the Waldorf-Astoria, New York, Aug. 27, unanimously pledged their loyalty to the government and gave expression to their desire to help to the maximum of their ability in the winning of the war. Primarily called at the request of the chamber of commerce of the United States for the purpose of organizing the industry for war service, a war service committee was elected as follows: Chairman, Frank J. Lanahan, president of the Fort Pitt Malleable Iron Co., Pittsburgh, and president of the American Malleable Castings association; H. F. Pope, president of the National Malleable Castings Co., Cleveland; John C. Haswell, president of the Dayton Malleable Iron Co., Dayton, O.; F. L. Sivyer, president of the Northwestern Malleable Iron Co., Milwaukee, and John E. Walker, president of the Wilmington Malleable Iron Works, Wilmington, Del. Inasmuch as the meeting was attended not only by members of the American Malleable Castings association, but by practically all other malleable castings makers as well, the war service committee named will be certified to the war industries board as the unanimous choice of the industry. Originally appointed by the American Iron and Steel institute to handle all matters concerning malleable castings, and endorsed at a meeting of the malleable iron castings makers held at Chicago, this committee has been considered as ably representative of the industry, and fitted for the most effective co-operation with the government.

Award Contracts With Care

Speakers at the meeting included Samuel P. Bush, president of the Buckeye Steel Casting Co., Columbus, now a member of the forgings, ordnance, small arms and ammunition department of the war industries board, and Major R. A. Bruce, of the ordnance department. The meeting was called to order by Franklin C. Parks, of the chamber of commerce of the United States, and was presided over by Frank J. Lanahan who was elected chairman. The basis on which government contracts are let, and the extent to which individual manufacturers are counted upon in the filling of war requirements was explained by Mr. Bush. It is one thing to secure a contract, he said, and an entirely different one to execute it; therefore the government is exercising great care to place contracts only with responsible companies, since each contract is a part of the general program and failure on the part of any one contractor involves the restriction of the entire program to that extent.

The extent to which malleable castings now are taking the place of steel castings in railroad car construction, and certain changes in specifications which now are under way in order to make certain castings a more practical foundry proposition was outlined by Mr. Lanahan. He also recounted the steps already taken, such as the retaining of an eminent metallurgist, and of an expert cost accountant, which, by putting the malleable industry upon a high and sound basis, are greatly increasing the value of this industry to the country. His remarks developed the fact that the malleable industry is unique in voluntarily having stiffened the physical requirements of its own product. The extent to which the malleable industry has grown was illustrated by Mr. Lanahan in a statement that the capacity of the country's malleable shops now is about 1,000,000 tons a year, valued in the neighborhood of $160,000,000.

Robert E. Belt, cost accountant of the American Malleable Castings association, said that as a result of the work which had been accomplished along the line of costs, most of the progressive malleable manufacturers now have the satisfaction of knowing that they are obtaining a fair return on the various castings they are making. As a result of these cost investigations, conditions in the industry have become stabilized and the hazard of failure due to lack of knowledge as to costs, has been greatly reduced.

H. J. H. Redhead showed the price table which has been drafted as a result of the investigation of costs, and he explained the methods which were followed in compiling it. This table, which is published herewith, was designed for the quarter ending Sept. 30, 1918. Malleable casting manufacturers are quoting these scheduled prices upon all new work, and will quote them on renewals of present contracts when they expire. The table is based upon conditions in various shops, in various parts of the country, said Mr. Redhead, and undoubtedly will serve for permanent use; the prices listed, he said, can be elevated or lowered in accordanec with conditions prevailing at the time a change is desired. In this table, Mr. Redhead said, the profit is the same for light castings at 30 cents a pound as for heavy castings at 7 cents per pound. Slides which were used to illustrate Mr. Redhead's remarks showed that the cost of labor in malleable foundries now is more than 100 per cent higher than up to the latter part of 1915; that the cost of castings increases inversely as their weight; that the cost of light cored castings increases more rapidly than the cost of plain light castings; that the cost of a casting increases in accordance with the weight of the mold; that immigrant labor from southern Europe is only 80 per cent as efficient as the average American-born worker and that the negro is only 60 per cent as efficient as the white American-born worker, etc.

Predicts Bright Future

John A. Penton, who was referred to by Chairman Lanahan as a man who did much to encourage the malleable makers during their darkest hours in past years, when the railroads were receiving such low grade castings from some malleable shops that they considered revising their specifications in order to replace malleable with steel castings, alluded to the efforts which were made by a few malleable makers at that time. These people saved the malleable business, he said. In the past 15 years, Mr. Penton said, no such progress has been made in any other branch of the iron and steel industry as in the foundry business, and in no branch is this more noticeable than in malleable. He predicted that the unselfish efforts which are being made to stabilize the industry and improve its product will result in establishing it upon a plane now undreamed of.

The facilities of the malleable foun-

dry industry for the manufacture of cast shells were comprehensively described in an address by Enrique Touceda, consulting engineer, Albany, N. Y. Through his prominent connection with the technical work of the American Malleable Castings association, Mr. Touceda is in a position to speak with authority. He outlined briefly the growth of the malleable castings industry in the United States, with particular reference to the progress that has been achieved in the past few years in improving the quality and uniformity of malleable through the concerted application of scientific research and control by leading manufacturers.

With reference to the work of the American Malleable Castings association in this connection and its possible bearing on the cast-shell program, Mr. Touceda said in part:

Before entering into the matter of the manufacture of semisteel, I would for your guidance like to give you a line on how our tensile test bars have run for the past three months, asking you to consider the fact that we have been handicapped through difficulty in obtaining proper pig irons and proper fuels. In May the average ultimate strength of all bars was 50,171 pounds and the average elongation 10.78 per cent; in June the average ultimate strength was 50,235 pounds, and the average elongation, 11.14 per cent; in July the average ultimate strength was 50,715 pounds and the average elongation 11.59 per cent.

Air Furnace Semisteel

It is an incontrovertible fact that semisteel can be made in an air furnace with great uniformity and with higher physical properties than is possible in the cupola. While it is unquestionably true that semisteel is being made in large quantities in the cupola, it is in our judgment certainly not the appartus best suited for that purpose. In the air furnace the entire charge is placed in the the hearth and the fuel does not come in contact with the molten metal. The malleable industry is a very large one, with a capacity of about 1,000,000 tons per year. I am asked to tell you that any knowledge we have gained through the work referred to is entirely and without reserve wholly at the disposal of the government.

We are arranging to have cupolas working as accessories to the air furnace and already at one plant have electric furnaces for the production of malleable iron castings. Any experiments that it may be necessary to make prior to the adoption of a specification we are willing and equipped to make. Our laboratories are complete and at the disposal of the government for research work along this line. We also are willing to train inspectors if they so desire, in order to hasten this end of the work. Finally, if by suggestion or study we can aid the authorities in any manner whatsoever, this we stand ready to do.

Prices for Malleable Castings

Casting weighing	Orders for quantities to be shipped as made, in lots of: 1000 molds or more		500 to 999 molds		200 to 499 molds		100 to 199 molds		less than 100 molds	
	Plain	Cored	Plain	Cored	Plain	Cored	Plain	Cored	Plain	Cored
Over 25 lbs. per casting										
Over 60 lbs. per mold.....	7.4	8.	7.8	8.4	8.1	8.8	9.6	10.4	14.8	16.
Over 35 to 60 lbs. per mold...	8.	8.7	8.4	9.1	8.8	9.6	10.4	11.3	16.	17.
Over 25 to 35 lbs. per mold..	8.7	9.7	9.1	10.2	9.6	10.7	11.3	12.5	17.	19.
Over 15 lbs. to 25 lbs. per casting										
Over 30 lbs. per mold.....	7.4	8.2	7.8	8.6	8.2	9.	9.6	10.7	15.	16.
Over 20 to 30 lbs. per mold..	8.2	9.1	8.6	9.6	9.1	10.2	10.7	11.8	16.5	18.
Over 15 to 20 lbs. per mold..	9.1	10.3	9.6	11.	10.2	11.8	11.8	13.4	18.	21.
Over 7 lbs. to 15 lbs. per casting										
Over 15 lbs. per mold.....	7.5	8.6	7.9	9.1	8.3	9.6	9.8	11.3	15.	17.
Over 10 to 15 lbs. per mold..	8.6	9.7	9.1	10.2	9.6	10.7	11.3	12.5	17.	19.
Over 7 to 10 lbs. per mold...	9.7	11.4	10.2	12.	10.7	12.5	12.5	14.8	19.	23.
Over 2 lbs. to 7 lbs. per casting										
Over 12 lbs. per mold.....	7.7	9.1	8.1	9.6	8.5	10.	10.	11.8	15.5	18.
Over 8 to 12 lbs. per mold...	9.1	10.3	9.6	11.	10.	11.4	11.8	13.4	18.	21.
Over 4 to 8 lbs. per mold....	10.3	12.	11.	12.5	11.4	13.1	13.4	15.5	21.	24.
Over 2 to 4 lbs. per mold....	11.4	13.1	12.	13.8	12.5	14.4	14.8	17.	23.	26.
Over 1 lb. to 2 lbs. per casting										
Over 10 lbs. per mold.....	8.	9.7	8.4	10.2	8.8	10.7	10.4	12.5	16.	19.
Over 6 to 10 lbs. per mold...	9.7	11.4	10.2	12.	10.7	12.5	12.5	14.8	19.	23.
Over 4 to 6 lbs. per mold....	11.4	13.1	12.	13.8	12.5	14.4	14.8	17.	23.	26.
Over 2 to 4 lbs. per mold....	12.5	15.	13.1	16.	13.8	17.	16.	19.	25.	30.
Over 1 to 2 lbs. per mold....	18.	22.	19.	23.	20.	24.	23.	29.	35.	45.
Over .5 lb. to 1 lb. per casting										
Over 8 lbs. per mold.....	8.4	10.4	8.8	11.	9.2	11.8	11.	13.4	17.	21.
Over 5 to 8 lbs. per mold....	10.3	12.	11.	12.5	11.8	13.1	13.4	15.5	21.	25.
Over 3 to 5 lbs. per mold....	12.5	15.	13.1	16.	13.8	17.	16.	19.	25.	30.
Over 1 to 3 lbs. per mold....	14.	17.	14.8	18.	15.5	19.	18.	22.	28.	35.
Over .5 to 1 lb. per mold...	20.	24.	21.	25.	22.	26.	26.	30.	40.	50.
Over .2 lb. to .5 lb. per casting										
Over 7 lbs. per mold.....	8.9	11.4	9.3	12	9.8	12.5	11.5	14.8	19.	24.
Over 5 to 7 lbs. per mold....	11.4	13.1	12.	13.8	12.5	14.4	14.8	17.	24.	27.
Over 3 to 5 lbs. per mold....	14.	17.	14.8	18.	15.5	19.	18.	22.	28.	35.
Over 1 to 3 lbs. per mold....	16.	19.	17.	20.	18.	21.	21.	25.	32.	40.
Over .2 to 1 lb. per mold....	25.	28.	27.	30.	29.	35.	35.	40.	50.	60.
2 lb. or less per casting										
Over 6 lbs. per mold.....	9.7	12.5	10.2	13.1	10.7	13.8	12.5	16.	21.	27.
Over 4 to 6 lbs. per mold....	12.5	15.	13.1	16.	13.8	17.	16.	19.	27.	30.
Over 2 to 4 lbs. per mold....	16.	19.	17.	20.	18.	21.	21.	25.	32.	40.
Over 1 to 2 lbs. per mold....	20.	23.	21.	24.	22.	25.	26.	30.	40.	45.
From .0 to 1 lb. per mold...	28.	30.	30.	35.	35.	40.	40.	50.	60.	70.

1. Prices above apply only to castings which may be shipped prior to Oct. 1, 1918. All deliveries made after Sept. 30, 1918, subject to prices in effect at time of shipment.

2. Terms—Net cash by 10th of month following shipment. No discount.

3. Prices are f.o.b. cars, works of the manufacturer, with allowance for freight at actual carload rate to freight station of purchaser. In no case, however, shall any allowance exceed 20c per 100 pounds.

4. An allowance of 25c per 100 pounds shall be made if castings are not sand blasted.

5. An allowance as follows shall be made if gates are not ground:

On castings weighing over 25 lbs.	$ .20 per 100 pounds
On castings weighing over 15 to 25 lbs.	.20 per 100 pounds
On castings weighing over 7 to 15 lbs.	.40 per 100 pounds
On castings weighing over 2 to 7 lbs.	.60 per 100 pounds
On castings weighing over 1 to 2 lbs.	.60 per 100 pounds
On castings weighing over .5 to 1 lb.	.80 per 100 pounds
On castings weighing over .2 to .5 lb.	.80 per 100 pounds
On castings weighing over .2 lb. or less	1.00 per 100 pounds

6. Sample castings submitted for any purpose to be billed at regular prices.

7. Extra charges will be made for—

Castings of intricate design; castings of very light or thin sections; castings requiring expensive or difficult coring; castings requiring extra deep flasks; castings subject to chemical or physical specifications or inspection (other than those tentatively adopted by the A. S. T. M.); castings requiring three-part flasks—50 per cent extra; castings requiring four-part flasks—100 per cent extra.

8. Charges for packages:

Bags—35c each, this amount to be refunded in case of bags returned prepaid and in usable condition; Kegs—60c each; Flour Barrels—$1.00 each; Oil Barrels—$1.50 each.

9. Pattern equipment in shape for economical production to be furnished by or at the expense of the customer, at rates current when the work is done and which are now—

$1.50 per hour for time; $1.00 per pound for brass, aluminum or white metal; 15c per pound for iron.

10. Manufacturer not to be liable for loss or damage arising from non-delivery of castings by reason of fires, strikes, accidents, governmental requirements or request from war or preparations therefor, or other causes beyond seller's control.

11. Buyer to save seller harmless from loss or damage by reason of the manufacture and sale of any patented device or part thereof, made in accordance with drawings, designs, models, or patterns furnished by buyer. No conditions printed or written upon formal orders or correspondence shall serve to modify or nullify this provision in any way.

Take Stock of All Steel

War Industries Board and Census Bureau Request Inventory of All Consumers to Guide Future Policies

Washington, Sept. 4.—The war industries board and the census bureau are making a countrywide inventory of stocks of steel on hand. This is important in view of the requirements for direct and indirect war needs.

The present estimated total production of steel in sight for the remainder of the year is 17,000,000 tons and war demands total over 23,000,000 tons with demand constantly rising. In an interview with the Washington newspaper correspondents, Chairman Baruch announced he could not approve requests for an ounce of steel for domestic use, because of imperative need of meeting the war needs.

The census bureau through its organization, is sending questionaires to more than 4000 manufacturers in this country asking complete reports of stocks of steel on hand down to the smallest holdings. It is sought to reach every manufacturer who uses steel in any way and in any amount in his industry. Careful compliance with the government plan to inventory the stocks on hand is expected confidently by the war industries board. A number of inquiries such as the automobile industry have been called upon to report stocks of steel on hand. That the war industries board may be guided in making an intelligent administration of steel stocks, Chairman Baruch decided, however, it as necessary to gather complete information from all steel-using industries.

Shell Program

Outlined By Ordnance Officers To Pittsburgh Manufacturers

Pittsburgh, Sept. 3.—Some idea of the shell program of the army general staff was disclosed at a meeting held at the chamber of commerce this morning for the purpose of acquainting manufacturers with government plans and of getting them to bid on the requirements.

A letter from the war industries board at Washington, presented at the meeting, stated that the requirements will be quite large and will necessitate going into the matter carefully in order to discover the best sources of production. Sources must be created for the production of 155-millimeter shrapnel shells, 155-millimeter high explosive shells, 75-millimeter high explosive shells and 12-inch high explosive shells.

A new plant is suggested for the 155-millimeter shrapnel shell having a capacity of 5000 shells per day both forging and machining. The additional requirements of 155-millimeter high explosive shells are approximating 35,000 shells per day. It is contemplated placing contracts among manufacturers who could turn out a minimum of 1000 shells per day, except in a few cases where companies with exceptionally good organizations would be given contracts for 500 shells a day.

Increased requirements of 75-millimeter high explosive shells will be approximately 80,000 shells per day. These shells can be made with more or less standard equipment and it is believed that these can be taken care of without requiring many if any new facilities. There are new requirements of 12-inch shells amounting to about 1500 shells per day. It has been difficult to find suitable sources of supply for this size and Pittsburgh officials of the war resources committee are urged to special effort in uncovering a source of supply.

The war industries board also is seeking assistance for the ordnance department in developing suitable sources of supplies of 6 and 8-inch semisteel shells, both machined and cast. It is proposed to make the castings in either air furnaces or cupolas. The war industries board believes that the most logical source for increased supplies are the foundries which have been making small engine cylinders and which should be

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The strike of machinists at Bridgeport, Conn., is holding up the manufacture of Browning machine guns at the plant of the Remington Arms Union Metallic Cartridge Co.

The Non-Ferrous Metals

Copper **Lead** **Spelter** **Tin**

	*Copper	†Spot Straits, tin	‡Lead, New York basis	Spelter St. Louis basis	‖Aluminum	Spot antimony
Aug. 28	26.00	.....	8.05	9.32½	33.00	14.25
Aug. 29	26.00	.....	8.05	9.25	33.00	14.25
Aug. 30	26.00	.....	8.05	9.12½	33.00	14.12½
Sept. 3	26.00	.....	8.05	....	33.00	.....

*Government fixed maximum price for prime lake, electrolytic and casting copper, in ingots, pigs, slabs, etc., less than carloads, 27.30c.
†No spot Straits tin offering.
‡Price agreed to by leading interest and independents.
‖Government fixed price for 98 to 99 per cent ingot aluminum in 50-ton lots; lots 15 to 50 tons, 33.10c; one to 15 tons, 33.20c.

New York, Sept. 3.—The tin markets both in this country and abroad have been declining steadily, but the reason for this movement is not known on this side of the water. Since Aug. 6, the prices of spot Straits and spot and future standard in London have declined from £399 to £353 10s, while the Singapore price has dropped from £406 to £353 10s. These decreases have been equivalent to about 10 cents a pound. Similarly, prices for spot tin in New York has taken a decided drop, due to larger arrivals from the East Indies. Spot Banca tin was offered today at 81 cents. An American tin commission is in London conferring with the British authorities on tin prices and distribution. It is conjectured that steps are being taken at these conferences which are at least partly responsible for the drastic liquidation of tin values.

Last week was extremely dull in the spelter market and with demand inactive, prices have sagged off slightly. Prime western spelter has sold at 9 cents for prompt September shipment, but supplies of this nearby position are comparatively scarce. Fourth quarter shipment is obtained at around 8.87½c, East St. Louis basis.

The lead situation is unchanged with producers unable to sell any more metal for September shipment. Essential consumers who need the lead at once must place their requirements before the lead producers committee. Prices remained at the agreed maximums of 8.05c New York basis, and 7.75c East St. Louis basis.

Aluminum producers are selling to only essential consumers working on war orders. Government maximum price on aluminum recently was extended to March 1. This price is 33c for 98 to 99 per cent ingot in 50-ton lots, with extras for smaller quantities and for manufactured products.

The antimony market is dull and weak and effects of the recent government buying of this metal no longer are felt. Spot antimony can be bought around 14 to 14.12½c New York.

Works' Occupations Standardized

Comprehensive System Evolved at East Pittsburgh Covering 20,000 Employes is Effective in Reducing Labor Turnover and in Promoting Harmonious Relations—Plan Embraces Wage Rates

BY W. D. STEARNS

WHILE industry is based on many operations, America today, has but one occuption—namely, to win the war. We have read, but are just beginning to realize what this war means, not only in the supreme sacrifice of our boys who have gone and are going across, but in the immense quantity of war supplies needed. We are just commencing to appreciate that the mines, farms and factories of America must be as well organized as the country's military forces in order to supply the latter with the necessities for winning the war.

Standardization Effective

Certain words have been used until we are all tired of them, but they embrace so much that is of vital importance that we must continue to use them. I refer to such words as organization, co-operation, efficiency and one of the later ones, although by no means new, standardization.

In this country much has been done along the lines of standardization. It is not unusual to see complete factory buildings erected in from one to three months. A gang of 120 men can erect 10 five-room houses in a single day. We think nothing of being able to buy standard machinery parts. These things are possible because of thorough standardization.

Standardized buildings, materials, machines, methods, and products are so common we take them for granted. These are of vast importance in winning the war, but of vital importance behind all is the man-power of the nation. Why not standardize men? At first thought this may seem unreasonable, but as one studies the problem he realizes both the need and possibility of standardizing the man-power of the country.

Chiefest of the problems confronting industry today is the efficient use of men. Secretary of Labor, William B. Wilson, has said: "The available man-power of the nation serving as the industrial arm in warfare is not employed to its fullest capacity, nor is it in all cases wisely directed. The effective conduct of the war is suffering needlessly because of the decrease in efficiency due to labor unrest."

Reasons for Labor Turnover

It would be better perhaps not to say standardize men but standardize conditions having to do with the human element in manufacturing. Something has already been accomplished along this line through state laws in regard to working hours, health protection, accident prevention and workmen's compensation. Working conditions have been standardized to a great extent among the employes of the government including those on large railroads, but little has been done until recently toward an attempt to standardize occupations or rates of pay.

The real labor problem is not so much the shortage of men as the matter of keeping them with any one concern long enough for them to become

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From a paper presented at the national conference of employment managers, Rochester, N. Y. The author W. D. Stearns is secretary, occupation and rate committee, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

INTERIOR OF ONE OF THE GREAT PLANTS OPERATED BY THE WESTINGHOUSE ELECTRIC & MFG. CO., WHERE THE PRINCIPLE OF STANDARDIZING OCCUPATIONS HAS BEEN THOROUGHLY TESTED

Classification of Jobs Effects Uniform Wage Schedules

Westinghouse Company Establishes Lists of 206 Occupations in 16 Departments

No.	Name of Occupation
16.	Assembler
3.	Babbitter
4.	Balancer, running
5.	Balancer, static
7.	Bander, rotor
84.	Battery repairman
8.	Beltman
9.	Blacksmith, general
10.	Blacksmith, helper
182.	Blacksmith, machine tool dresser
12.	Boiler cleaner
11.	Boiler maker
15.	Bolt threader
13.	Boring mill, horizontal
14.	Boring mill, vertical
20.	Box maker
21.	Box marker
24.	Brakeman, railroad
26.	Brazier
22.	Bricklayer
165.	Bull block man
27.	Cabinet maker
501.	Calculating machine operator
28.	Carpenter
30.	Centering machine
32.	Chauffeur
29.	Checker, car
31.	Checker, materials
503.	Checking clerk
23.	Chipper
33.	Coil assembler
41.	Coil presser
40.	Coiling and bending
35.	Coils, form and pull
502.	Compiler
183.	Conductor, railroad
19.	Connector
39.	Coppersmith
36.	Core builder
37.	Coremaker
504.	Correspondent
42.	Coslettizer
505.	Cost clerk
43.	Craneman
44.	Cutting off machine
48.	Demonstrator
506.	Dictaphone operator
46.	Die-casting maker
47.	Diemaker
163.	Draw bench
49.	Drill press
507.	Duplicator operator
164.	Edging machine
50.	Electrode maker
52.	Elevator man
53.	Emery wheel dresser
55.	Engineman, stationary
34.	Engineman, locomotive
508.	File clerk
59.	File cutter
60.	File sharpener
58.	Filer
25.	Fireman, locomotive
64.	Fitter
18.	Foreman, assistant
71.	Forger drop
72.	Forger, hammersmith
17.	Forging machine
62.	Formerman
63.	Furnaceman
65.	Galvanizer
66.	Gear cutter
509.	General clerk
180.	Graduate student
67.	Grinder
73.	Hammer operator
68.	Handyman
184.	Heat treater
172.	Heaterman
74.	Helper, machine
75.	Hoop rolling machine
57.	Hostler, locomotive
1.	Industrial auto truck driver
82.	Industrial locomotive
79.	Inspector, equipment
80.	Inspector, production
86.	Instructor
81.	Instrument maker
61.	Insulator
178.	Lagger
87.	Lamp trimmer
88.	Lathe, engine
89.	Lathe, turret
90.	Layerout
523.	Ledgerman
94.	Machine tool setter
174.	Machinist, journeyman
510.	Mail clerk
92.	Marble driller
93.	Marble enameler
91.	Marble worker
95.	Material cutter
56.	Matron
97.	Mica and composition worker
69.	Mica builder, hand
70.	Mica builder, machine
51.	Mica gauger
98.	Micarta finisher
38.	Micarta former
45.	Micarta roller
96.	Milling machine
99.	Millwright
102.	Motor tender
104.	Molder, bench
105.	Molder, floor
103.	Molder, machine
101.	Moveman
511.	Office boy or girl
107.	Oiler
108.	Packer
111.	Painter
110.	Patternmaker, metal
109.	Patternmaker, wood
112.	Pipe fitter
512.	Pay roll clerk
113.	Planer
114.	Plater
115.	Plumber
134.	Police officer
116.	Polisher
77.	Press, hydraulic or pneumatic
513.	Production clerk
78.	Pumpman
118.	Punch or power press
161.	Repairman
119.	Rigger
120.	Riveter
177.	Roll turner
167.	Roller, cold
166.	Roller, hot
168.	Rougher
6.	Saw, band or circular
121.	Saw filer, hand
122.	Saw filing, machine
124.	Screw machine, automatic
123.	Screw machine, hand
125.	Set up for test
76.	Sewing machine
126.	Shaper
127.	Shearman
128.	Sheet metal worker
54.	Sheet steel painting machine
171.	Shipper
129.	Sign writer
130.	Slater
2.	Sleeve machine
170.	Slitting machine
131.	Slotter
132.	Solderer, pot
173.	Solderer, hand
522.	Special
514.	Special office machine operator
181.	Special student
133.	Springmaker
515.	Stenographer
135.	Stockman
137.	Stoker
136.	Storeroom attendant
169.	Straightener
138.	Structural iron worker
106.	Switchboard mounter
139.	Switchboard operator
83.	Switchman, industrial
160.	Taper
517.	Telephone operator
175.	Tester, electrical
140.	Tester, mechanical
518.	Time clerk
141.	Tinner
142.	Tinsmith
146.	Tool dresser, wood
145.	Toolmaker
143.	Tool handler
144.	Tool temperer and hardener
519.	Tracer
148.	Trackman, railroad
179.	Trades apprentice
520.	Transcribing clerk
149.	Transformer mounter
147.	Treat, dip and insulate
521.	Typist
150.	Undercut commutator
85.	Unskilled workman: Ashman; auto truck helper; bricklayer, helper; coal handler; coil separator, copper; concrete worker; die casting maker, helper; dipper, acid; dipper, plater; freight handler; furnaceman helper; grinder, rough; hook on crane; janitor; lumber handler; magnetic separator; material handler; millwright, helper; oil separator and washer; pickler; sand blast operator; sheet steel handler; slater, helper; stoker oiler; sweeper; trucker; wheelbarrow man; and wiper.
151.	Water tender
155.	Weigher
152.	Welder, arc
153.	Welder, butt or spot
154.	Welder, oxyacetylene
159.	Winder, Coil—field and transformer
117.	Winder, coil—rotor and stator
162.	Winder, rotor
176.	Winder, stator
100.	Winding-mold setter
158.	Wireman, apparatus
157.	Wireman, shop
156.	Wood working machine

trained and to absorb the spirit of their employer and feel that they are part of the organization.

It is human and right for each man to want to improve his own condition and each is eager for the new and untried. Much of the present abnormal labor turnover doubtless is due to these inborn tendencies which lead the workman to "shop for jobs." Just at the present time the shopping is particularly good. All concerns have much to offer both in opportunity and wages. Anything that may be done to reduce this constant shifting of the workman from plant to plant is of especial importance now.

Workmen do not know how conditions in one plant compare with those in another. In fact, employers have no means of comparing conditions in their works with those elsewhere. It is difficult for two industrial managers, even if their products be similar, to talk intelligently regarding occupations or rates of pay, because they do not have a common nomenclature. Different words are often used for the same operation and a man whom one manufacturer might consider a first-class operator would be a third-class operator for another. Even if standard names were used for standard jobs and each job were classified according to the skill required for that job, there still would exist the inconsistencies between plants regarding rates of pay. Part of this difference in rates of pay will be due to difference in local conditions, but if there were a common language in which all could discuss these differences, many of them would be eliminated.

Outline of General Scheme

The work of standardizing occupations and rates naturally divides itself into four parts:

1. To determine standard occupations.
2. To divide all employes into classes based upon their relative value to the industry.
3. To determine what class of man is needed for each occupation.
4. To determine rates of pay for the various classes.

1. *To Determine Standard Occupations*

All occupations used should be listed. These should be subdivided into separate occupations only so far as the work is distinctly different and requires different operations and a worker of different qualifications. These occupations should be carefully defined and given standard names.

2. *To Classify Employes*

This is the most difficult and at the same time the most important part of the work. The scheme is to place all employes in classes, grouped, not at all according to occupation, but according to the value of the service that each employe renders. The measure of this service may be based on the degree of mechanical skill, supervising ability, initiative and judgment, physical strength and endurance, or willingness to do disagreeable work. Five divisions have been adopted for this classification and, in a general way, what these divisions are intended to comprehend may be obtained from the following descriptions and examples:

CLASS A

Leaders in charge of groups, experimental workers, and those on the highest grade production work. Those possessing general knowledge of the manufacturing operations, methods and materials used. Judgment, accuracy and a high degree of skill and dependability are necessary. These men include engine lathe, planer and boring mill operators on very large work where great loss is incurred if mistakes are made; instrument makers and tool makers.

CLASS B

Accurate, dependable workers with considerable ability and experience but without the expert knowledge and experience required of those in Class A. Generally, operators on accurate or heavy work which is usually repeated. Employes in this class include engine lathe operators, work not especially accurate but laborious; work on smaller lathes where responsibility is great, as on commutators and collectors after being assembled on shafts; planer operators on medium sized work where there is much repetition; vertical boring mill operators on large work, and accurate difficult work on small mills.

CLASS C

Workmen who have become proficient on lines of work which are usually repeated, such as engine lathe operators on repetition work and on roughing shafts; planer operators on rough work such as roughing stock for poles, and boring mill operators on small repetition work.

CLASS D

Workmen who can be trained in a short time to be efficient producers on lines of work which are usually repeated, such as employes learning to operate engine lathes, planers, boring mills; learning winding.

CLASS E

Unskilled workmen with little, if any, previous training; men on work requiring a small degree of skill, accuracy and knowledge. This class includes unskilled workmen, such as truckers, sweepers, material handlers and machine helpers.

This broad classification is based upon the employe's relative value to the industry, regardless of his particular occupation. Each class may include a variety of occupations and many occupations may require employes from several classes. For example, we may have tool makers, lathe hands and boring mill hands all in class A. We may have lathe hands in classes B, C and D.

A man may be of value not only for reasons inherent in himself but for reasons inherent in the occupation. The work may be especially dirty, hot, cold, unhealthy or dangerous, thus giving employes for this occupation a classification higher than they would have from any personal qualifications.

3. *To Determine Class of Men*

The class of men needed should be determined from the nature of the work to be performed. For example: suppose the occupation be engine lathe operator and the operation be rough turning shafts. A class C man would do this work satisfactorily. Suppose the occupation still be engine lathe operator, but the operation be taking the finishing out on shafts. It would take a class B man to do this work satisfactorily.

4. *To Determine Rates of Pay*

The rates of pay for the highest class and for the lowest class are determined by the labor market in the special locality. Having determined these two limits it remains to distribute the rates between the various classes.

Westinghouse Problem Outlined

So much for the general scheme. Now for the specific problem as found in the East Pittsburgh works of the Westinghouse Electric & Mfg. Co. This company employes 20,000 operatives. Its product is a complete line of electrical apparatus. The plant is made up of 16 departments, each being practically a separate factory, with its own superintendent and foremen. All of these superintendents report to a general superintendent.

Because of the nature of its work, this company employs practically all of the occupations known to the metal trades, and many others that are peculiar to the electrical industry. Many of the departments have operations that are very similar and often exactly alike. If an employe in one department is paid more or less than an employe who renders exactly the same service in another department, then there is much dissatisfaction and a decided tendency to shift from department to department. Labor turnover and all other statistical data to be of greatest value should be kept by occupation. In an attempt to overcome such difficulties an occupation and rate committee was appointed to study the situation and devise a method of classifying and standardizing occupations and rates of pay.

Occupations in each department were tabulated. It was found that different

names were often used for the same occupation. These were all given a common name and when brought into one list it contained over 400 distinct occupations. These were finally grouped and condensed into a list of about 200, which was adopted as standard. Numbers and standard names were assigned to these occupations and care is taken to use this standard wording on all forms and records dealing with occupations.

Had the work gone no further than this it would have been worth while, if for no other reason than to have all statistical records on the same basis, and for all superintendents to be able to talk over their problems on a common ground. With a well organized employment department something of this sort is practically indispensable. Such a department also demands something in the way of an occupation analysis card and this again necessitates standardizing the occupations.

The next step was to determine the number of men on each occupation in each department and the class in which the men on each occupation should be placed. For example, a boring mill in one department might require a class "C" man while a boring mill in another department might require a class "A" man. Likewise one department might itself have several different kinds of engine lathe work which would require men from classes "B," "C" and "D."

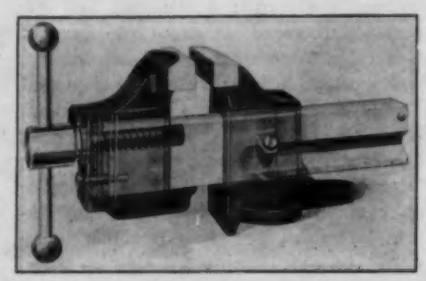
Wage Rate Assigned

After all the occupations in the departments were placed in their proper classes the prevailing wage scale was applied to these classes, that is, the highest wages were allowed for class A and the lowest wages for class E employes. Suppose, for example, our highest wage on a day work basis at the time the scheme was inaugurated had been 50 cents an hour, and our lowest had been 15 cents an hour, then class A employes might have been rated from 40 to 50 cents and class E employes from 15 to 20 cents. A key sheet was made up showing the range of rates of pay for each class. This range in rates allows for normal increases, due to increased efficiency, long service, etc. The minimum rate authorized for a class is, in general, the maximum hiring rate. The higher rates are to be used only for the most skilled in that class. The higher class occupations requiring skill, experience, or special ability should be filled by promotion or transfer from another department wherever possible.

An occupation and rate book is made up for each superintendent. Every occupation in the entire factory is given in this book in alphabetical order. The classes authorized for each occupation are given together with the various departments which are authorized to use that class of employes.

The occupation analysis cards are made out in triplicate; one for the foreman, one for the employment department and one for the occupation and rate committee. Each foreman has only the cards for the occupations in his subdepartments. These cards show what classes he is expected to use for the operations he has.

If the occupation is properly classified in the first place, in general, the classification should not be changed unless the nature of the work or operation is changed. If the rate allowed is not high enough to retain the employe in this occupation, then one of two things should be done. Either the man should be promoted to an occupation which requires a higher class man or else there should be a flat raise in rates for all the classes. The chief advantage in using a key sheet to show the rates paid for the various classes is that only the class letter is used on all records, so that any changes in the wage scale simply means issuing a new key sheet with the corresponding new rates. It is the duty of the occupation and rate committee to establish new occupations and rates, approve changes in rates and investigate any unusual conditions due to rate of pay.



IMPROVED BENCH VISE

The two fundamentals of the plan are: First, the determination of standard occupations and the choice of specific names and definitions for these occupations, and second, the classification of workers in accordance with their value to the industry, regardless of occupation.

The two ideals of the plan are: First, uniform rates of pay for uniform service, thus preventing the discontent that might arise due to nonuniform wages and, second, to maintain wages for each occupation within a certain range, and when an employe reaches the limit of that range to facilitate his promotion to an occupation of higher values.

This work has been growing at the Westinghouse plant for about two years and has proved so satisfactory that it is being extended just as rapidly as possible to allied companies.

It seems logical to liken the departments in our company to the various companies in a given district. If each company in a district were to standardize its own occupations and rates in some general way, as has been outlined, they might be able to get together on common ground and do much toward reducing labor turnover.

The only way to make this effective would be for all companies in the district to be working on the same fundamental scheme using the same standards. This could be accomplished through a small district committee. Such a committee should consist of a man of very broad experience familiar with manufacturing operations and a statistician, both of whom would devote their entire time to the work. In addition, there should be two or three representative men to act in an advisory capacity.

This work might very profitably be taken up by the employers' associations or similar organizations. It would help to solve the problem for an individual district but the labor problem is no longer one of individual districts. The ultimate aim should be such a standardization for the whole country.

Quickly Operated Vise

Practical mechanics know from experience that much time is consumed in adjusting an ordinary bench vise to take different widths of work. The vise shown in the accompanying illustration was recently developed by the Velox Vise Co., Inc., Lowville, N. Y., with the object of overcoming this difficulty.

The vise has a steel bar. It is pointed out that the screw and nut are made sufficiently strong to withstand hard usage. To operate the vise, the workman lifts the front jaw slightly, which disengages the screw and allows the front jaw to be moved either in or out. To clamp the work, the front jaw is pushed inward until it is in contact with the piece, after which the screw is tightened. In releasing the work, the screw is loosened slightly. Two adjusting screws are provided, one on each side of the bar, which are adjusted slightly as soon as the bar shows signs of slipping. It is pointed out that the steel bar permits of compact construction which allows ample clearance in the throat of the vise. The vises are made in several patterns for machinists, filers and other handicraftsmen. Both plain and swivel bases are provided to meet all requirements.

On to Berlin! Via Watervliet

UNCLE SAM'S arsenal at Watervliet, near Albany, N. Y., is one of the busiest places in the country. Fig. 1, breeches of large-size gun. Fig. 2, a 12-inch gun emerging from a bath in a 90-foot shrinking pit. Fig. 3, a 12-inch gun being lifted by a 217-ton crane. Fig. 4, looking through a 12-inch howitzer. Fig. 5, some American 55-millimeter guns. Fig. 6, general view of plant, showing breech rings, recoil bands, brackets and other vital parts of the big guns.

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Making Expert Machinists of Our Boys

BY B. K. PRICE

A "BORN MECHANIC" MILLING THE TAILSTOCK OF A TAPPING MACHINE ON A MOTOR-DRIVEN, VERTICAL MILLING MACHINE. HE IS 14 AND HAS BEEN IN THE TRADE SCHOOL FOUR MONTHS

INDUSTRY has never had a keener appreciation of the function of the vocational school than it has today. The shortage of skilled machinists as brought out by the war and the seeming inability of industry itself to remedy the situation has placed the vocational school in a position of considerable importance.

The extent of the present scarcity of skilled machinists has been clearly set forth by developments of the past year. Of 11,000 men, who claimed to be skilled, applying for work in a New England state during one month last winter only 1200 were found to be competent machinists. Of 8000 machinists applying for work in another state only 170 proved to be dependable. It has been demonstrated that only one of 10 applicants for work in which skill is required are skilled men.

In an effort to relieve this situation some of the larger machine tool manufacturers have installed schools in their shops, and, as a matter of fact, this had been done to a certain extent long before the war, for even then the shortage of skilled labor was becoming apparent. Most of the schools thus established have been successful in training apprentices, but due in no small measure to the wholesale stealing of labor among competing manufacturers, the movement which began several years ago with the sudden expansion of the automobile industry, this idea of training men has never been generally taken up. Too many manufacturers still are engaged in devising ways and means of obtaining a man after he has been trained elsewhere instead of establishing regular courses for training the novice in their own shops. As a result, employers today are paying a high price for their neglect of vocational training and the demand for all-around men has proved its need.

Formerly, opportunities for learning a trade were many and the apprentice was taught in a fine school and not put upon a planer or a lathe until good for little else. Due to American quantity production methods, however, most of these opportunities have vanished. In the average factory of today the machine and tool room organizations are composed of a few all-round machinists with the larger number of workmen trained only along definite lines. With such a force it is possible to operate a shop efficiently as long as the labor turnover is small but let there be the least semblance of an industrial flurry of any description and this turnover begins, and with it a corresponding reduction in plant efficiency. Industrial activity occasioned by the war has emphasized this point forcibly.

Advance is Slow

Whether or not the installation of training schools in the various plants throughout the country will become in anyway general in the future is problematical. Judging from present indications, the process will at least be slow. So, consequently, it would seem as if the brunt of this highly-important work will fall to the vocational schools which already have contributed heavily to the ranks of American artisans.

Foremost among the vocational schools at this time are the Boardman Apprentice Shops, of New Haven, Conn. Situated in the center of New England's industrial activity, they are brought into intimate touch with the various problems of shop practice which constantly arise, and therefore, a brief description of the shops and the work being accomplished may prove of interest. After operating as a manual training school for more than a score of years, the Boardman Apprentice shops were reorganized in 1913 as a trade school. Under the direction of Frank L. Glynn, since state director of vocational training of Wisconsin, and later under Robert O. Beebe, now director of vocational schools, Essex county, N. J., it was made a model institution of its class.

Here the different trades are taught under actual shop conditions. The

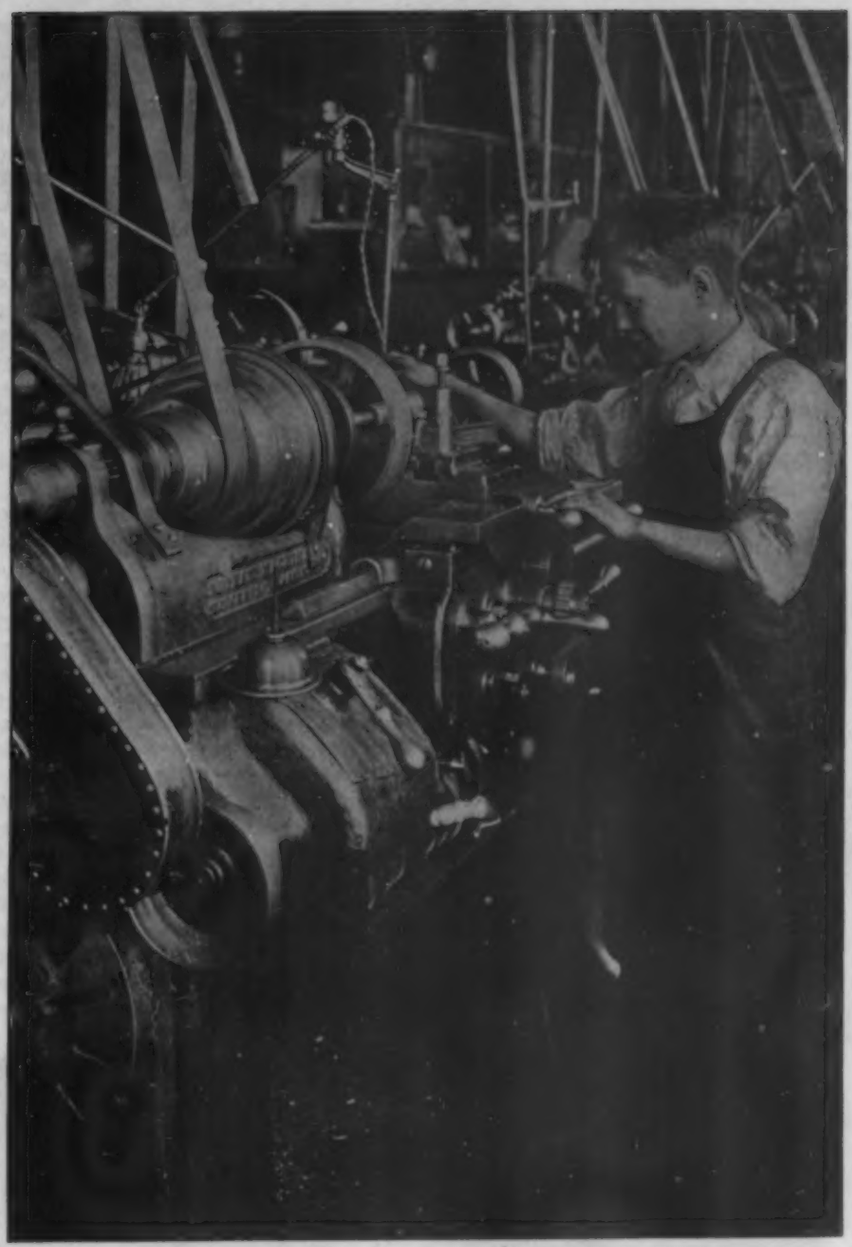
pupil, or appentice, as he is called, rings the clock and has his work assigned to him as though in a workroom with professionals. He has his time tickets and works from blueprints made from drawing and tracings made by boys. Also there is a boy time clerk. He has his foreman and is in a shop atmosphere all the time he is at work. With such conditions it is almost needless to say that when the boy is trained and later goes into a plant he "fits in," and consequently is less inclined to become dissatisfied. This, of course, tends to reduce turnover. In this connection, it may be added, that wage questions are more easily settled with the trained man, for his skill enables him to produce more work and therefore earn better pay.

Work Is Varied

Although the Boardman school is run practically as a business plant would be operated, the fact that it is a school is not lost sight of. The work is varied so that each pupil will receive a necessary amount of training in each of many operations. It can be taken up at any time by a pupil and is laid out in a course, involving 4800 hours of study. Seventy-five per cent of this time must be spent in practice of the trade taught and 25 per cent in academic studies relating to the trade and in attending lectures and demonstrations. Students are urged to study handbooks and catalogs and to read trade papers. The importance of keeping abreast with new developments in the industry is held before them at all times.

The school is in operation eight hours daily, five and one-half days a week, 50 weeks a year, and the equipment is in use practically all the time. During the period that the trade school boys are at academic studies the boys from the New Haven high school, which adjoins, are receiving manual training under the regular Boardman staff, assisted by high school teachers assigned to Boardman. Related trades exchange departments and instructors for part of the time. The drafting class will exchange with the machine shop class once a week and they also get in some pattern and forging practice. Night classes of men from the local factories are taught in continuation classes. The machine department runs six nights and one afternoon a week for nearly six months a year on continuation work. Instructors from the local plants are called in for this work, which is under the supervision of one of the regular day force.

The machine department, which is the largest in the school, is thoroughly equipped with machines of the latest type and has an average of 50 students. Complete machines are built here and every operation, excepting that of casting, is done by pupils about 15 years of age. The foundry work is shown by a few shop visits and by practice in lead molding, given to patternmakers, but it is not taught as a trade. The machine department follows the operations of drafting, tracing, pattern making, snagging castings, rough machine work, machining parts, assembling and crating, boys doing all the work. As they enter the school they are given the rougher work of snagging the castings and painting the machines, and are placed in what is known as class D. A few days at this and they are promoted to class C, where they do simple machine work. Next they are placed in class B, where the making of parts and the more difficult operations are taught. In class A, the boys assemble the parts and finish the machines ready for inspection.



ONE OUT OF EVERY 15 BOYS ENTERING THE SCHOOL IS FOUND TO BE A "NATURAL MECHANIC". THIS BOY, WHO IS TURNING A 10-INCH PULLEY FOR A COUNTERSHAFT IS 14 YEARS OLD AND HAS BEEN IN THE TRADE SCHOOL BUT SIX WEEKS

Machines Are Sold

The pupils at this school are engaged in useful production throughout their training. In the past four years more than 500 complete working machines have been shipped to England, Scotland, France, Spain, Holland,

Canada and various parts of the United States. One lot of 45 tapping machines were sent boxed to a plant in Glasgow for use on munitions. The machines built are in use in some of the largest plants in this country. The list includes tapping machines, screw slotting machinery, lathes, etc. In addition, 150 drill press vises, 75 slide rests and thousands of small tools have been made by boys in this department. The head instructor is Frank R. Lawrence, now acting director of the entire school, who has had a wide experience in both the manufacturing and executive ends of shop practice.

The manner in which the school is serving in war emergency training is indicated by the following instance. In 1914, shortly after the outbreak of the war in Europe, the munition plants in southern Connecticut became severely taxed for skilled labor. The Winchester Repeating Arms Co., of New Haven, was one of the plants thus affected. Furthermore, this company needed tools. The company had taken on extensive munition contracts, and in addition to extending its own facilities greatly, began contracting with various shops for their equipment, especially for toolmaking, and the Boardman Apprentice Shops were approached. The school wanted to help and it needed contact with industry.

Consequently, regular orders accompanied by commercial blueprints and specifications were taken and put right into the machine shop for production as a "by-product" to the training. An order for several hundred end mills would be taken and the material would be supplied by the Winchester company at the regular piece-work price plus the overhead agreed upon and the cost of material was billed regularly to the school. By such an arrangement the burden of the wage scale was taken off of the industry during the learning period and a trained man was produced with decreased overhead. The plan also provided, as Mr. Glynn, then director of the school, pointed out, a democratic opportunity for a man to improve himself and increase his wage scale. The feeling of useful service performed was of value to the students.

The war has taken its toll of a number of the larger boys at the school, many of whom have left and have gone to work. This is an unfortunate situation all schools throughout the country are facing. Machine apprentices, even with a partial training, are in great demand and can obtain employment at virtually any stage of their course. Despite such losses, however, the Boardman Apprentice Shops are making a splendid record, a fact that proves the value of this plan of vocational training and gives promise of far greater results in the future when the war ends and normal conditions prevail. War time conditions have proved school's value.

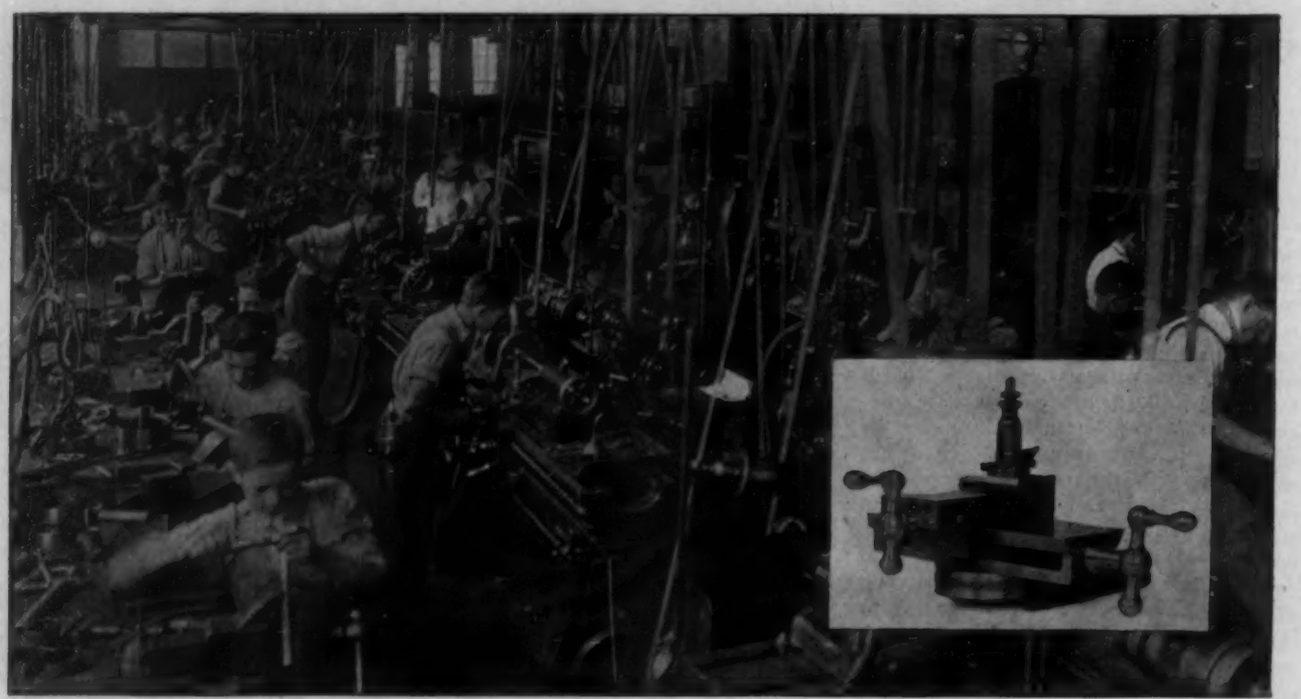
Book Review

Sheet Metal Workers' Manual, by L. Bromel and J. S. Daugherty; leather; 552 pages, 4x6½ inches; published by Frederick J. Drake & Co., and furnished by THE IRON TRADE REVIEW for $2.00.

The book was written, according to the authors, in response to a demand for a comprehensive treatise on the machinery, tools and methods employed in sheet-metal working. Mr. Bromel is a practical sheet metal worker and has spared no pains to make his explanations clear in every respect. The work includes practical instructions on every branch of sheet-metal work, the different steps of which are illustrated by means of line drawings.

Mr. Daugherty who is an instructor in sheet-metal work at Carnegie Institute of Technology, Pittsburgh, has contributed a special course in elementary and advanced sheet-metal work and pattern drafting for sheet-metal workers.

The book is divided into 15 chapters as follows: The sheet-metal industry, machinery, tools, and school-shop equipment, course in elementary and advanced sheet-metal work and pattern drafting, outline course in sheet metal work—emergency war training, oxy-acetylene welding and cutting, electric welding, hand forging and welding, course in forge practice, outline course in hand forging and welding—emergency war training, brazing, pipe bending, properties of metals and their alloys, practical geometry and mensuration and useful tables for practical use.



YOUNG AMERICA LEARNING THE MACHINIST'S TRADE. THE EQUIPMENT IN THIS SCHOOL IS OF THE LATEST TYPE AND HAS ENABLED THE STUDENTS IN ONE DEPARTMENT TO PRODUCE $10,000 WORTH OF MACHINERY. THE INTRICATE CHARACTER OF THE WORK IS SHOWN BY THE SLIDE REST FOR A 12-INCH LATHE, MADE BY 15-YEAR-OLD BOYS

Conducts Tests on Twist Drills

University of Illinois Carries Out an Elaborate Series of Tests to Determine the Efficiency of Drills—Some Results of the Experiments—Recent Development of Drill Has Been Rapid

THE forerunner of the present-day twist drill was the flat drill used generations ago. This was generally forged from tool steel at the cross-roads blacksmith shop and shaped according to the ideas of the maker. It was diamond shaped at the cutting edge and sharpened on the grindstone. Drills of this type are used at the present day for a limited number of purposes, among them being chucking holes in work that is held in a lathe chuck.

The twist drill is thought to have been discovered by accident. In all probability, some blacksmith twisted the initial one while hot and discovered that he had produced a more efficient tool than the flat drill. It was not until drills began to be made as a special product, however, in 1862 by the Morse Twist Drill Co., New Bedford, Mass., that radical improvements were made over the old form of flat twisted drill. Experiments were then begun with different forms of milled flutes, with the helix angle of the flutes, with different forms of point grinding and with the composition of the steel used to determine the influence of these factors.

The chief disadvantages of drills used prior to the last decade lay in the fact that they had to be kept cool to prevent drawing the temper. For this reason the drill had to be run slowly, or provision had to be made for a supply of a cooling or lubricating medium. Such tools fell short of the demands of modern production and after high-speed steel had proved its value as a material for lathe and planer tools, attempts were made to adapt this material to twist drills.

High-speed steel twist drills are still in the process of development, both with reference to the material used and the form of the drill. The basic principles of design determined upon for carbon-steel drills have, to a large extent, been incorporated in the high-speed drill. More experimentation is necessary to establish the correct helix angle, flute space, web thickness and point grinding.

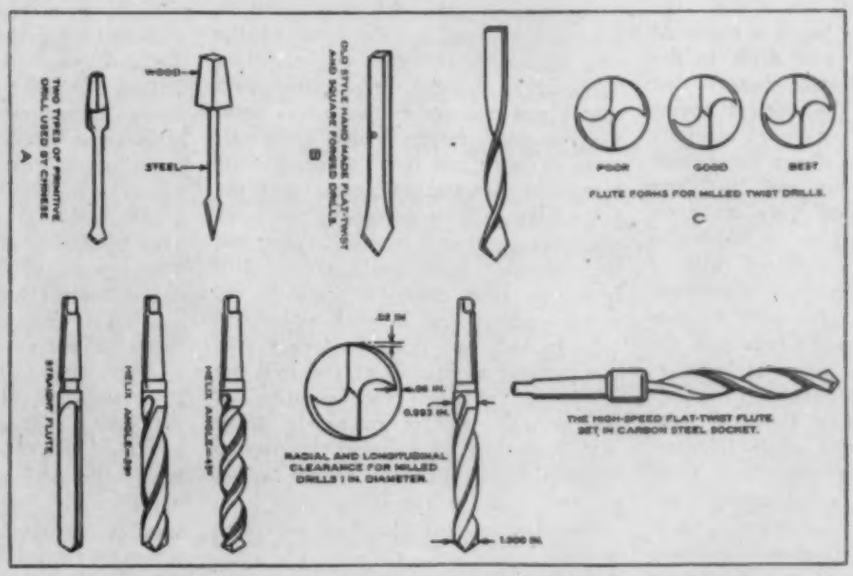
The steel used in the manufacture of high-speed steel drills varies greatly among different manufacturers. It has been determined by analysis that the composition varies widely and also that the carbon content shows no regularity. The proportion of carbon varies from 0.25 to 0.60 per cent, manganese from 0.25 to 0.60 per cent, chromium from 0.00 to 5 per cent, tungsten from 10 to 20 per cent and cobalt, vanadium, silicon, etc., within narrow limits, according to the ideas of different drill manufacturers. Thus, the matter of the most desirable alloy is a question of conjecture that remains to be investigated further through a future series of experiments.

The early types of drills were simple affairs for the most part, as the example shown at *A* in the accompanying illustration, reveals. Drills of this kind usually had their lips so shaped that they could be rotated in either direction. The drill shown at *B* is a development of the primitive type. It is made more substantial and is capable of producing a better hole. The flat twist drill also illustrated at *B* is twisted by hand while in a heated state. The twist is neither uniform nor of any particular angle. The object of this design was to facilitate the removal of the chips by screwing them out of the hole.

Efforts to make the helix of a uniform angle, to provide adequate chip space and to combine strength with economy of material resulted in the production of the twist drill wherein the flutes were milled. The first of these drills was made about 1850 and they proved disappointing because of weakness and lack of endurance. It was not until Morse in 1864 brought out a drill having more obtuse points and cutting edges that the value of the milled twist drill began to be recognized.

The best form of flute is still a subject of discussion, various manufacturers using different forms. Three flute forms are shown at *C*. The requirements are the flutes are of proper design to shape the chips in a compact helix while drilling steel and that adequate space for the disposal of the chips is provided. Generally, the milling cutters used for drill fluting are so shaped that in connection with a 118-degree included point angle the cutting lips will be in a straight line.

The standard form of lathe tool for turning cast iron has a back slope, or rake, of 8 degrees, a front slope or clearance of 6 degrees and a side slope of 14 degrees. This combination results in a lip angle of 68 degrees. For turning steel, the rake and clearance angles are the same, but the side slope is 22 degrees, which gives a lip angle of 61 degrees. Assuming that the average angle of a twist drill should correspond to the cutting edge of a lathe tool, it will be found that the correct drill for cast iron will have a helix angle of 28 degrees at the periphery, while the correctly formed drill for steel will have a corresponding helix



SEVERAL TYPES, FORMS AND CHARACTERISTICS OF DRILLS

Abstracted from a report on an investigation of twist drills made at the University of Illinois by Bruce W. Benedict and W. Penn Lukens.

angle of 40 degrees. According to this theory, the drill which would produce the best results on both cast iron and steel would have a helix angle of 34 or 35 degrees at the periphery. This theoretical deduction cannot, however, be relied upon for practical application since the entire output of the twist drill is different from that of a lathe tool. No two points on the cutting edge travel at the same speed. The drill point is kept cool only as the heat is conducted away from it by the metal being cut. The support given the drill by the metal upon which it is operating, the varying clearance of the cutting edge, and the difficulty of cooling and of chip disposal, cause drill design to present its own problems. However, it is probable that much has been learned through the study of lathe tool problems. It is reasonable to suppose that if the carbon steel drill would give satisfactory service with an angle of 25 degrees, the high-speed steel drill would show equal efficiency with a sharper cutting edge, that is, with a helix angle of from 30 to 35 degrees at the drill periphery.

It is an accepted fact that the helix angle of the drill flutes influences the angle of the cutting edge. But the angle is not the only factor which influences the form and angle of the cutting edge. Other factors include the point angle, the flute form and the web thickness of the drill as well as the peculiarities of point grinding.

Considering the actual form of the edge as shaped by the average drill grinder, it will be observed that, when viewed from the side, it has a slight convex curve. In a correctly ground drill the advancing edge is straight. This is true because the drill manufacturers have designed the flute millers in order to produce this straight edge in combination with a 118-degree angle.

With the foregoing knowledge, the University of Illinois began a series of exhaustive tests on twist drills to determine several important factors that have a bearing on the efficient operation of drills. The tests were carefully conducted under the direct supervision of Bruce W. Benedict and W. Penn Lukens. All the tests were made on cast iron. The machine in which the tests were made was fitted with a dynamometer for accurately registering results. After the tests were finished the following conclusions regarding the performance of drills were reached:

1.—With the usual angles of grinding, the power used at the drill point decreases as the helix angle increases until the value of the helix angle reaches 35 degrees, above which there is no further decrease in power. Above 40 degrees the power begins to increase. A helix angle of 30 to 35 degrees seems also to give the best average endurance in cast iron.

2.—For corresponding speeds and rates of feed, the variation in torque for point angles between 108 and 138 degrees is slight, but torque increases for point angle values below 108 degrees. The variation in thrust for point angles between 98 and 118 degrees is slight, but the thrust increases rapidly as the point angle increases above 118 degrees. Drills with point angles greater than 118 degrees show less endurance than drills with point angles smaller than 118 degrees, while drills with point angles less than 118 degrees show less susceptibility to burning of the corners, although a greater liability to chipping of the cutting edge and a general weakness of the drill due to the removal of metal backing the chisel point. In general, a point angle of about 110 degrees seems more satisfactory than an angle of 118 degrees.

3.—Variations in the clearance angle at the drill periphery and variations in the clearance at the drill center (as indicated by the value of the edge angle) seem to affect the net power slightly. Unless the peripheral clearance is less than 2 degrees, variations in its value have very slight effect on the values of torque or thrust, but if the edge angle is less than 120 degrees, the thrust tends to increase, showing a more rapid rate of increase for the heavier rates of feed. A peripheral clearance of about 6 or 7 degrees seems to be the most satisfactory value as affecting drill endurance. An edge angle of 130 degrees is recommended for all but the heaviest feeds (above 0.041 inch per revolution). This angle should not vary with variations in peripheral clearance, but may be varied with the feed per revolution, decreasing for light feeds and increasing for heavy feeds.

4.—The power required at the drill point and the drill endurance seem to be much affected by the form of the chip space and the form of the cutting lip. Drills having the greatest chip spaces and concave cutting edges seem to give good results under all conditions of work and point grinding. Attempts to increase chip space near the hilt of the drill by decreasing the helix angle are apparently of small value, and the decreased helix angle as the drill is ground away causes increases in the power required and lessened endurance.

5.—In soft cast iron the torque does not increase so rapidly as the feed per revolution, although the variation of torque with feed is so nearly direct that it may for all practical purposes be so considered. For the correct angles of drill grinding the thrust should increase directly with the feed per revolution.

6.—In soft cast iron the torque decreases as the speed increases, although there is little advantage in running a 1-inch drill faster than 350 revolutions per minute. The saving in power resulting from increasing speed may amount to 10 or 15 per cent. Thrust decreases as speed increases for corresponding rates of feed, although the advantages to be gained by running a 1-inch drill faster than 400 revolutions per minute are slight. The decrease in thrust may amount to 15 per cent.

7.—Drilling a pilot hole the diameter of which is equal to the width of the chisel edge reduces the thrust of the large hole by 60 or 70 per cent, the reduction being greatest for the heavier feeds. The torque of the larger drill varies according to the area of metal removed by the pilot drill. For the average drill this means a saving in net power of 1 per cent.

8.—The power loss in the back gears of a drill press increases directly as the feed per revolution and may be from 5 to 8 per cent of the total power consumed. The efficiency of the drilling apparatus increases with the rate of drilling, and for these tests varied between 8 and 60 per cent. The net power for a given rate of drilling varies with the feed used, being greater for the light feeds and less for the heavy feeds, although there is a slight advantage in using a feed greater than 0.041 inch per revolution. The gross power is a function of several variables, including the variation in net power, the power consumption of the drill when running idle, the increase in torque and thrust for the heavier feeds, and the means of gearing for different speeds. For general good efficiency of drilling with this apparatus in cast iron, the feed should not be less than 0.013 inch per revolution and should increase with the rate of drilling to 0.041 inch per revolution for a rate of 9 inches per minute.

9.—By first drilling a pilot hole with a diameter equal to the thickness of the drill web, the gross power when drilling the larger hole may be reduced 10 or 12 per cent. A blunt drill increases the gross power by reason of the greater thrust which causes greater losses in the drill press. A drill with a point angle greater than 118 degrees or a drill with an edge angle less than 130 degrees will increase the gross power for the same reason.

10.—The endurance of a drill may be increased 300 to 1000 per cent by the simple process of rounding the sharp corners at the drill periphery.

11.—For drilling holes at the depths of more than 3 inches a drill with a large helix angle gives best results. Such holes should be drilled at as high a speed as possible, for then the screwing action of the drill flutes removes the chips more readily throughout the operation.

Compact Punch Press of New Type

The Sheet Metal Working Machine Described is a Distinct Departure from the Usual Design—The Crank Shaft is in the Base and the Machine is Self Contained

IN the development of machinery for punching and forming sheet metal, the same general design, wherein the strain is torsional, has been followed. The machine shown in the accompanying illustrations is a radical departure from the general accepted design of sheet metal working machinery as the strains set up while the work is in progress are tensile and compressive. The tool is a development of the Henry & Wright Mfg. Co., Hartford, Conn. The company calls its product a dying machine and points out that it may be used for blanking, piercing, forming, coining or drawing.

It is pointed out that the danger of injury to the machine through overloading is greatly lessened. Provision has been made for keeping the dies in constant alignment, so that they should remain sharp for a long period, resulting in smooth edges to the work without heavy burrs. This principle is similar to that employed in the sub-press.

Weight is Materially Lessened

The driving mechanism is located below the die plates. This does away with any obstruction to light and is designed to give the machine correct balance and permit it to be constructed with less weight without any reduction in strength. One result of good balancing is the elimination of much of the noise which results when the die breaks through the metal, due to the sudden letting go of the excessive elastic strain. Further to deaden noise the chute into which the punchings fall is covered with leather.

The relation or register of the punch and the die is preserved through the medium of four pedestals, one at each corner of the base frame. The upper member is firmly bolted to the pedestals and is thus given the necessary up and down motion which is transmitted from the crank shaft through the medium of the pedestals. Felt protected dust guards surround each of the pedestals.

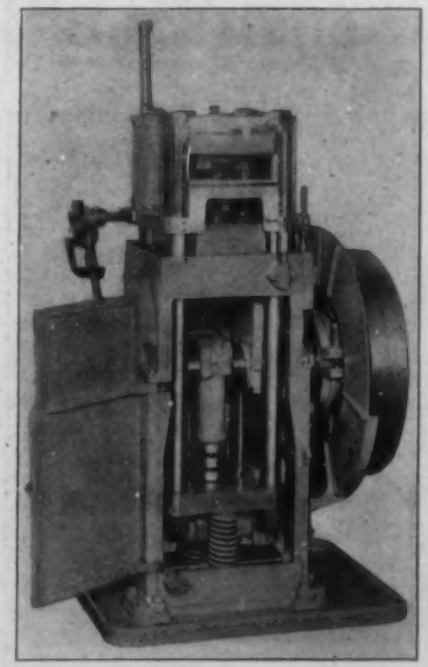


FIG. 1—SIDE VIEW OF PRESS SHOWING OPERATING MECHANISM

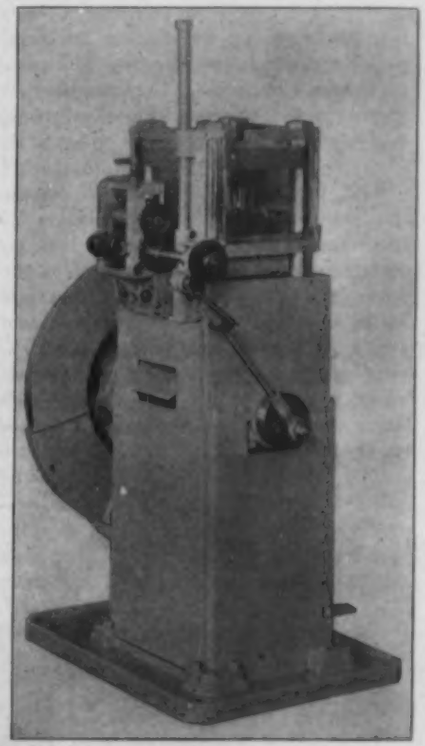


FIG. 2—FRONT AND LEFT SIDES OF MACHINE SHOWING ROLL FEED

The design of the machine, it is pointed out, lends itself easily to the use of various attachments such as finger motions, automatic feeding mechanisms, scrap cutters, dial feeding devices, etc. The pedestals form a natural hub for the attachment of dial feeding devices. These machines are designed compactly, so that they may be used advantageously in groups. A line of machines can be placed under a bench of the height of the dies and run by belts attached to pulleys on a line shaft underneath the bench.

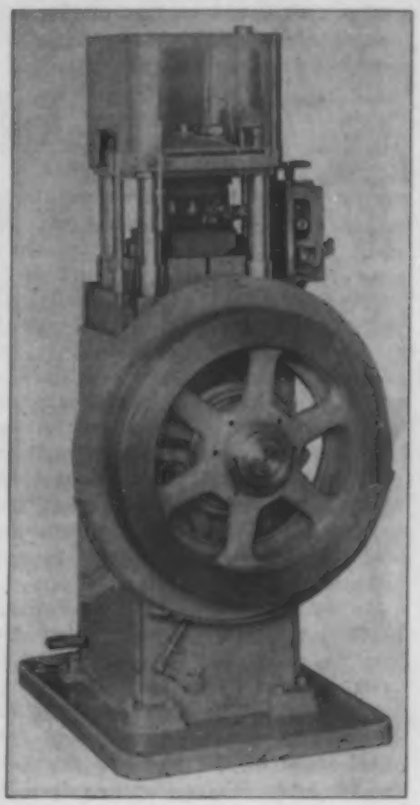


FIG. 3—SAFETY CAGE RAISED SHOWING THE PUNCH AND DIE

Dies Are Easily Set

It is said that it is comparatively easy to set the dies accurately in the machine, as it is only necessary to set the shank of the upper die holder through the top plate, tighten up the bolt which draws it up, fit the lower die to the upper one, lower the frame so that the lower die fits into the die bed, adjust the depth gage to the position required and the setting is complete.

A safety device has been incorporated which consists of a cage fitting entirely over the top of the machine. This cage must be raised in order to get a hand or finger between the dies. Further, when the cage is raised, the machine is locked so that it cannot operate until the cage

is lowered. In its normal position, the cage is equipped with holes sufficiently large for the metal to be inserted but not large enough for either a finger or hand to enter.

The machine may be operated either from a sitting or a standing position, and the dies may be fed from any side.

The working dimensions of the machine shown in the accompanying illustrations are as follows:

Rated capacity, tons	25
Weight of fly wheel, pounds	300
Throw, inches	1½
Adjustment, inches	2
Distance between under side of top plate and working surface of machine when upper plate is raised to its highest point, inches	10
Distance between vertical shafts, in.	8
Diameter of crank shaft, inches	3
Diameter of vertical steel shaft, inches	2
Size of hole in center of working surface, inches	6 x 7
Diameter of fly wheel, inches	24
Face of fly wheel, inches	4
Floor space, inches	24 x 31½
Height of machine over all, inches	52

Machine Is Compact

Fig. 1 shows a front and side view of the machine. The foot lever for single operation work and the hand lever situated near the wheel guard for continuous operation work are shown. In this illustration the door in the machine base is open, exposing the internal mechanism for operating the upper die. This consists of a base plate actuated by a connecting rod equipped with nuts for adjusting the depth of the die stroke. Four heavy steel pedestals connect this plate with the upper member that carries the die. The bearings, which consist of four inserted bronze bushings at the top of the machine and two cross head guides at the sides of the lower plate also are shown. Springs are provided. While these are not essential, they help to make the motion of the machine smoother.

Fig. 2 shows the front and left sides of the machine and a view of the roll feeding device. This illustration also shows the mouth of the chute. Fig. 3 shows the machine with the safety cage raised, exposing the dies.

Large Planer Built of Concrete

ONE of the biggest problems met in carrying on modern warfare is to manufacture massive machine tools in the minimum amount of time. Where weeks could be spent in the building of machine tools before the war, days must suffice under present conditions.

An original method of speeding up production in the machine tool industry was the substitution of reinforced concrete for cast iron in building a massive planer to be used for finishing the beds of gun-boring machines. The development of this tool was described in THE IRON TRADE REVIEW, April 4, 1918. Another manufacturer, David A. Wright, Chicago, has now gone a step further in rapid machine tool construction, secured through the use of concrete. In this case, a planer constructed largely of concrete has been designed to take the place of the regular universal planer in which heavy, gray-iron castings are employed. The machine is shown in the accompanying illustration.

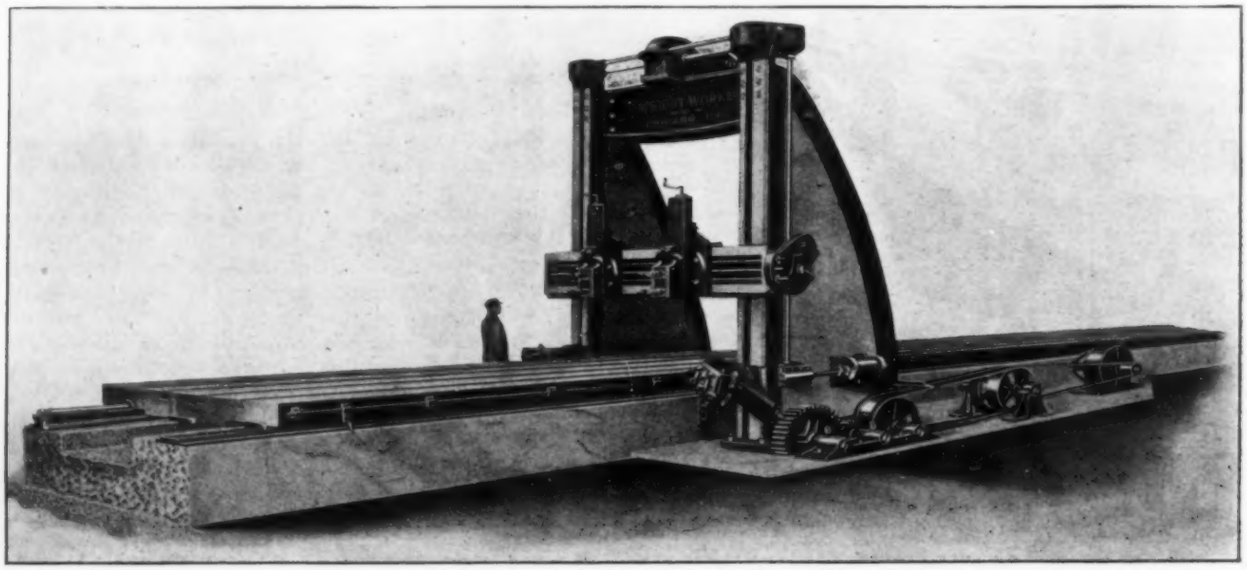
Details of Construction

This machine is designed to handle the same class of work as planers of the regular type. The tool is constructed as follows: The frames for the side housings are cast iron and are made in three parts, front, back and base. After they are finished and fastened together, the intervening space is filled with reinforced concrete which holds the three pieces firmly together as an integral unit.

The platen of this machine, also, is of novel design. It is made of structural steel in which cast-iron strips to contain the T-slots are arranged. The body of the platen is reinforced concrete. After the platen is placed in position, its upper surface is finished off according to the method followed in facing off any planer platen in order to insure a level surface.

The platen travels on two ways, the design of which is a decided departure from present-day practice. One way is circular in form, as the illustration shows, and is ground-steel shafting. The other way is flat and is cast iron. The round way sets in a V-shaped container and both ways are firmly anchored to the foundation, or bed, which is built entirely of reinforced concrete. The details of this construction and the way in which concrete has been utilized are indicated.

Aside from its concrete construction this planer follows the same general design of standard metal planers. The machine shown is equipped with two



THIS TOOL WAS DESIGNED FOR RAPID CONSTRUCTION— NOTE THE SOLID CONCRETE BED

heads on the cross rail and two side heads. The reversing motion for the platen is supplied by the motor, which is of the reversing type. The reversing operation is controlled by dogs which can be set at any desired point on the edge of the platen. These dogs operate a pole changing switch. The feed for the tool heads is actuated by a pneumatic device, while a motor is employed for raising and lowering the cross rail. The planer shown is made in several sizes ranging from 6 x 6 feet to 20 x 20 feet under and between housings. The bed length can be varied.

France Regulates Machine Tool Business

BY FRANCIS MILTOUN
Paris Correspondent of The Iron Trade Review

THE day has passed when one can criticise a government for laying down industrial regulations. War regulations may differ from those in time of peace, but the motive is the same, the greatest good for the greatest number, no matter how private interests may suffer. Whether the paternalism of France should be carried to the limit is another matter, but certain it is that if the reorganization and reconstruction of a greater, more puissant France is ever to be brought about the work of this war period will not be the least useful assurance of that desired status after the war.

A new law has recently been formulated by the French minister of armament and fabrications of war whereby the whole business in machine tools is to be "regulated," to put it in its mildest phase. Under date of Aug. 2 the *Journal Officiel* published the clauses of the decree which provides for the classification, utilization and importation and sale of machine tools in France. A decree it should be noted is a temporary affair which may be rescinded without legislation. In brief, its articles are set forth as follows:

Under the appellation of "machine tools" are included all such as come under the French tariff classification of paragraph 525, and in addition such mechanical accessories as are employed generally in factories to the exclusion of generators of *force motrice*, or energy. The sources through which such may be obtained are only French constructors, authorized dealers and the machine tool *comptoir*, or warehouse. Supplementary to this regulation we have authorization to manufacture, authorization to purchase such and authorization for delivery.

Regulating Imports

Finally, the clause which has, perhaps, the most interest for the United States is that importation of machine tools is under a similar ruling. As to the selling price the government warehouse takes a net profit of 2 per cent over the c.i.f. plus duty charges after having added another 6 per cent for its cost of overhead. This *comptoir* service is intended only for French manufacturers and dealers.

Practically all machine tools imported until further notice will come through the *comptoir* unless a permit to import on a priority order is granted direct from some manufacturer working on a war contract. In case of machines bought from the *comptoir* by authorized dealers they in turn will be allowed to add another 18 per cent to the price to cover all their overhead, profits and other expenses. This of itself eliminates the "shoe-string" dealer. Imported machine tools have their prices based on what the French manufacturer can produce a similar machine for, plus a 10 per cent profit net for him. This is a genuine protection of industry against which no one can object. It will work effectually, whatever other legislation there may be after the war, against the introduction of German-made goods.

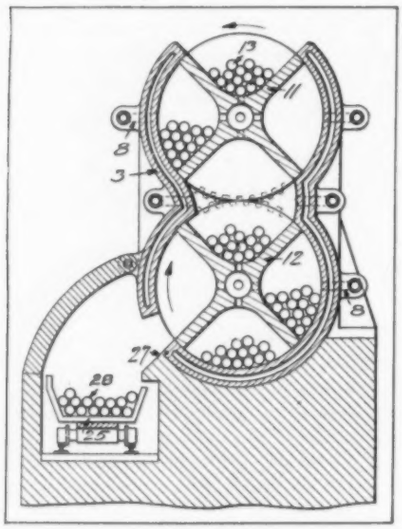
The decree was signed Aug. 1 by Clemenceau, minister of war; Loucheur, minister of armament; Clementel, minister of the merchant marine, and Klotz, minister of finance.

Blast-Furnace Design Effects Operation

BY G. L. COLLORD
Vice President and General Manager, Shenango Furnace Co., Pittsburgh

WHEN our furnaces were lined up with small hearths from 12 to 14 feet in diameter and flat boshes with angles from 72 to 75 degrees, we could run along fairly regularly and make a uniform grade of iron, provided there were no irregularities in the raw materials or interruptions in operations. When anything interfered, such as a shut-down of 12 hours or more, a different grade of coke or ore, or a change of atmospheric conditions would generally bring about an irregularly working furnace. This resulted in a lower tonnage, an off-grade of iron, and an increase in coke consumption and production of flue dust.

Especially was this the case when it was necessary to change a furnace from one grade of iron to another. It would often take from two to 10 days to change from a high to low-silicon iron with attendant irregularities mentioned heretofore; these changes have been much simplified with a furnace lined up according to modern practice. I want to give one particular instance to illustrate this point. In 1914, when there was not much demand for iron, it was necessary to take orders for almost any grade that was offered. We had only one furnace in blast at this time. It had been recently rebuilt on modern lines with a 16-foot hearth and a 79-degree bosh angle. This furnace ran for months, making bessemer iron which analyzed from 2 to 2.50 per cent silicon for six days in the week, and low-silicon iron below 1 per cent on Sunday. On one occasion it was necessary to fill an order for 500 tons of iron of 4 per cent silicon. By lightening the ore burden, increasing the acid elements in the slag, and carrying all the stove heats possible, the iron changed from 1 per cent silicon to 5 per cent in 12 hours and back to 2 per cent silicon in another 24 hours without the furnace making a miss-move of any kind. The output for this period was maintained above 500 tons per 24 hours, and coke consumption was below 2000 pounds per ton iron. I think I am safe in saying this would be impossible with the furnace before it was redesigned. A number of furnacemen making high-silicon iron, hesitate to put in the steep boshes. This is a mistake. We have one furnace with a 78-degree bosh angle running nearly four years and another with a 79-degree angle, running



REVOLVING FURNACE FOR ANNEALING BARS AND TUBES

three years and believe the average silicon in the iron produced on each furnace would run 2.25 per cent. Flue dust loss on one furnace has been as low as 77 pounds per ton of pig for a year. This compares with 388 pounds on a former blast.

Relation of Iron to Hearth Size

Another point I want to mention. That is the physical quality of iron produced on a large-hearth furnace, compared with the small. A large percentage of our iron goes into ingot molds. They require an iron which will expand and contract readily with the frequent filling of molten steel. This requires a soft iron. It has been proven from experience that iron produced in a small-hearth furnace will have the same silicon, sulphur, phosphorus and manganese content as iron produced in a large-hearth furnace. However, the iron is harder and generally closer grained and does not withstand expansion and contraction like the iron produced in the large-hearth furnace. We find also that the graphitic carbon is about ½ per cent higher in iron made in larger-hearth furnaces. This indicates much softer iron.

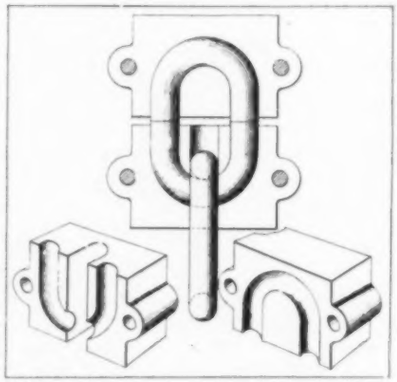
During the past severe winter it was necessary to bank furnaces for weeks at a time, due to the coke shortage. Again, the furnaces constructed on the new lines showed their superiority over the old ones. We shut furnaces down, expecting to start them within 48 hours and would give the furnaces a small quantity of extra coke. Instead of being down two days, we would have the blast off two weeks or more. On starting up, we would have one cast of iron dull in appearance and sluggish in running, but the second cast would be good physically and chemically. In other words, the modern furnace will stand more abuse than those used years ago. We furnacemen connected with companies outside of the United States Steel Corp. and other larger operators, are much indebted to them for the complete data they so willingly and cheerfully gave us.

Annealing Furnace

Among the recent inventions designed to save labor is the novel annealing furnace shown in the accompanying illustration. The device, which is particularly adapted to annealing bars and tubes, has been patented by James D. Adams, North Belle Vernon, Pa.

The object of the invention as set forth by the inventor is to provide means for carrying on the work continuously; one lot of pieces being charged into the furnace while a previous lot is being discharged.

The illustration is a sectional view of the furnace. This consists principally



DIES FOR CHAIN WELDING

of a framework, 3, in which revolve two cross-shaped cradles, 11 and 12. These are connected by spur gearing and revolve simultaneously in opposite directions. The furnace is heated with gas which is supplied to the heating chambers through the pipes 8.

In operating the furnace, a supply of bars or tubes is lowered into a compartment of the upper cradle where they take the position shown at 13. As the cradles slowly revolve, the charge is carried to the closed portion of the furnace while another section of the upper cradle comes in position to receive another charge. The revolution of the upper cradle causes the material to be discharged into the lower cradle and later through the opening 27 to a conveniently placed car as shown at 28.

It is pointed out that the material receives a uniform heating during its passage through the furnace due to the fact that the separate pieces are bound to change their relative positions as the cradles slowly revolve.

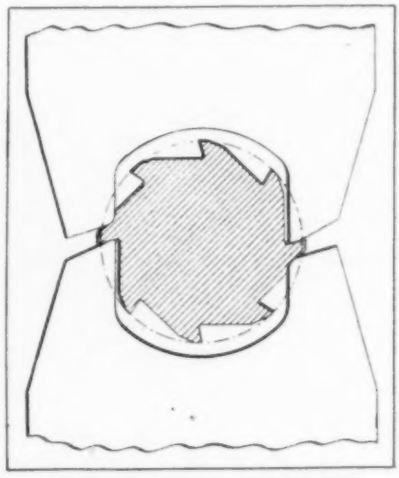
Electrically Welded Chain

A development in the manufacture of iron chain was recently patented by a New York inventor, Thomas E. Murray. The process generally followed in making lightweight iron chain is first to wind the stock into the form of a helix, just as a closed spring is wound. The arbor upon which the material is wound is machined to impart the desired shape to the chain links. Next, the material to form the separate links is cut away, one coil at a time. One link is heated and the ends welded together, another link is built on the same way and so on until a shot of chain of the desired length is obtained.

The object of Mr. Murray's invention is to provide a more efficient means of welding chain links. In his process, the link is first formed in two U-shaped sections. These are placed in suitable jaws of an electric welding machine where they are fused together, the two sections forming an integral link. The shape of the jaws used is shown in the accompanying illustration. The lower section of one jaw, which is shown at the right, is to accommodate the end of the chain that is in process of formation. The jaw shown opposite is provided with a slot to accommodate the chain that has already been completed, since this must pass through the jaws as it is formed.

To Reclaim Reamers

A device for salvaging small tools has been invented by Harley H. LaVercombe, Detroit. It is used for swaging the blades of reamers that have been worn undersize. The device, which is patented, consists of two dies as shown in the accompany-



DIES FOR SWAGING REAMERS

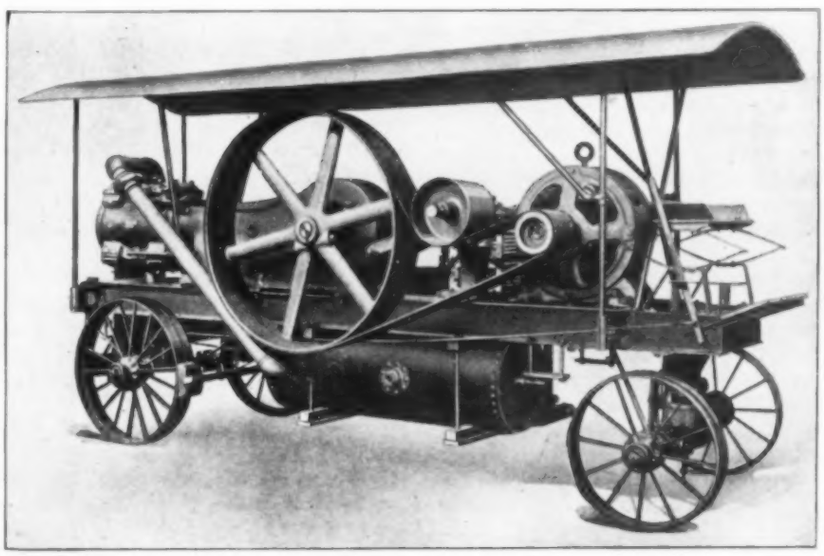
ing illustration. These are fitted to a drop press. The reamer is heated, inserted between the dies and the upper die is allowed to descend several times, this operation being repeated on all the teeth. The result is that the teeth are drawn out radially to a point where the reamer is oversize so that after rehardening it can be ground to its original size. One reamer may be swaged repeatedly.

High Temperature Cement

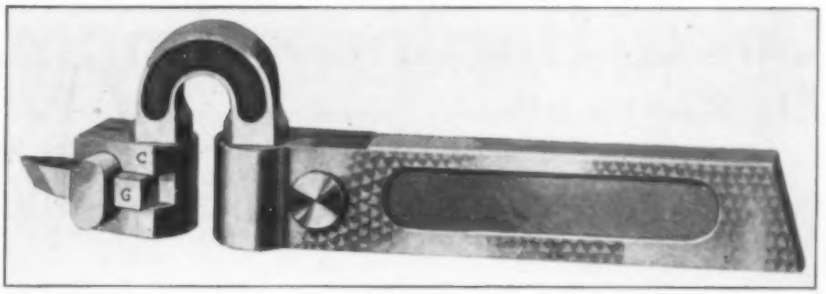
The Hausfeld Co., Harrison, O., manufacturer of nonferrous melting furnaces and other foundry equipment, is now producing a highly refractory cement adapted for patching and surfacing brick linings of melting furnaces, for lining ladles, etc. Tests made to ascertain the fusing point of this material indicated no loss of refractoriness until a temperature of 3002 degrees Fahr. was attained, which was the fusing point of a No. 26 Seger cone. This is equal to 1650 degrees Cent., a temperature greatly in excess of that required for nonferrous metals.

Motor Driven Compressor

At this time when the labor problem is a large issue, the portable compressor seems more valuable than ever. Because of the rapidity with which it works and the immense amount of labor it saves, air operated tools, such as drills, hammers, rivets, chisels, reamers, caulkers and tampers, have been universally employed by contractors and builders. The electrically-operated, portable compressor shown in the accompanying illustration, is especially adapted for city work where current is available and is more conveniently and easily handled than corresponding steam, gasoline or oil-operated types. It consists of a 10 x 12-inch compressor, built by the Ingersoll-Rand Co., New York. The compressor is driven by a 50 horsepower, Westinghouse motor and has a capacity of 300 cubic feet of air per minute at 100 pounds pressure.



PORTABLE COMPRESSOR INCREASES USE OF PNEUMATIC TOOLS



TOOL HOLDER DESIGNED TO ELIMINATE CHATTERING WHILE TAKING FINISHING CUTS

Spring-Head Tool Holder

The tool shown in the accompanying illustration is of the spring-head or gooseneck type and is designed for use in the lathe, shaper or manufacturing automatic for performing such operations as forming, threading, grooving, cutting-off, etc., where it is essential to eliminate chattering.

The tool consists of a shank *A*, gooseneck *B*, tool head *C* and the cutting tool *G*. It is pointed out that the tool is designed for light cuts only, that is, it is not a hogging tool. It is said that the spring head relieves chatter and gives a smooth cut.

The tool can be adjusted right or left to any angle up to 90 degrees. Three tool clamps are provided which take regular stock in flats $\frac{1}{8}$ x $\frac{3}{8}$ inch, rounds $\frac{3}{16}$ to $\frac{1}{4}$ inch and $\frac{5}{16}$-inch squares. It is pointed out that the tool conserves high-speed steel as it uses bitts down to a length of $\frac{5}{8}$ inch and it is also said that cutting-off tools can be used successfully as thin as 0.014 inch.

It is not claimed that this tool eliminates the use of regular rigid holders, but that it is designed especially for light cuts where smoothness and freedom from chatter marks are sought. All parts of the tool are made of forged steel and tempered.

Supervises Engineering Employment

Government supervision of employment for technical men has been inaugurated by the United States employment service, through the establishment of a division of engineering with A. H. Krom of Chicago, formerly secretary of the American Association of Engineers, as director. Mr. Krom is a graduate of the school of electrical engineering, Purdue university, and for the past eight years has been actively engaged on utility development and promotional work. Recently, he was engineer in charge of the Chicago office, state public utilities commission of Illinois.

War demands on the engineering profession have already caused a serious shortage of men with mechanical designing experience and those with practical experience in chemical engineering. All the technical men of the country must be reached and, in addition, all men with technical experience must be carefully registered so that they will be immediately available. The advantages of such a governmental registering and systematizing of employment will be apparent at once, to the engineer. As a result of tremendous demands for technical service, due to the war, several years might be wasted through scattered individual effort and lack of cooperation between the members of the profession and the technical societies. Greater engineering is needed to win the war and the government demands unity and efficiency in the technical profession to assure early victory. The highest efficiency is obtained through practical organization.

Coke Hardness Important Factor

British Expert Declares Success in Working Blast Furnace is Chiefly Dependent on Mechanical Condition of Coke—Tests Show Output Falls Off When Hardness Falls Below 74 Per Cent

BY G. D. COCHRANE

SUCCESS in working a blast furnace is chiefly dependent on the mechanical condition of the coke used. This may appear to be a sweeping assertion, but I will endeavor to warrant it, subject to the reservation that the mechanical portion of the plant is in average working condition. There is no doubt that the question of the mechanical condition of the coke is a controversial subject, but it has not received the attention and investigation its importance in blast furnace practice calls for.

The percentage of ash in coke and analysis of ash, factors which affect coke consumption and quality of iron, may be anticipated and calculated but the determination of coke hardness is a matter worthy of serious thought and exact tests.

Tests for Hardness

In making a test for hardness a sample of coke weighing 28 pounds is placed in a drum which is revolved 1000 times at the rate of 18 revolutions per minute. The coke is taken out and riddled over a ½-inch mesh when that which remains on the riddle is weighed and the percentage of the original 28 pounds noted. That percentage we call the "hardness" of the coke. By making such tests I obtained a good comparative record, and by closely watching and comparing furnace drivings with the percentage of coke hardness I found there was a close connection between the two.

The next item to determine was at what point on the coke hardness scale the drivings commenced to fall off and this was found to lie between 74 and 74½ per cent of hardness. During the past eight years this has been proved correct on so many occasions that I do not hesitate to say that in connection with our own plant we know there will be slow driving and consequent trouble when the hardness falls below that percentage.

I have not been able to trace any additional advantage with coke of a higher percentage of hardness than 76 but on plants where a blast pressure in excess of seven pounds per square inch is used or available it may be found that a higher percentage results more beneficially. When the hardness falls below 74 per cent there is a marked falling off in the drivings, and I find that the lower the percentage the worse are the drivings. I have had the experience during the past 12 months of using a considerable quantity of coke which has only averaged 70.5 per cent of hardness, and I estimate that as a direct result the drivings of the blast furnaces have fallen 20 per cent.

When coke is charged into a blast furnace it immediately comes into contact with the ascending gases which act on it in a degree dependent upon its mechanical condition and the temperature of the gases. Many experiments have been made in the laboratory with a view to illustrating this reaction, and it has always been found that the gases have far less effect on hard coke. It seems to be conclusively proved that if coke of over 74 per cent hardness is used little loss occurs at the top of the furnace, but if coke below 74 per cent hardness is used the loss may be considerable.

A soft coke is usually friable and unless the ovens are situated close to the blast furnace, so a minimum of handling is assured, it usually reaches the furnaces in a much smaller form than is the case with hard coke, consequently a greater area is exposed to the action of the gases as soon as it is charged into the furnace. I am, of course, referring to furnaces with comparatively large makes, such as many in the United States, a smaller coke is necessary, but it must still be hard. Having commenced its passage through the furnace in a small state, I think it becomes finely divided before reaching the melting zone, and in support of this theory I should like to tell you of my experience at the Ormesby furnaces.

Trouble had been experienced at one of the coke-oven plants from which our coke supplies came, and the coke charged into the furnace was soft and friable. The furnaces struggled along for a few days, gradually driving slower and slower, until the coke commenced to improve; but owing to the poor coke the drivings of one of the furnaces had become so slow we feared it was commencing to hang, as we could not get the slag to run. Taking out the front tuyeres, we applied the blast and this solved our troubles, for great clouds of fine coke dust were blown out. The tuyeres were replaced, the furnace commenced to drive again freely and with the better coke coming down we had no further trouble.

If hard coke is sent to the furnaces the life of a blast furnace manager is pleasant, but with soft coke his life is not worth living. With the former, one gets the furnaces driving freely, a low coke consumption, an even quality of iron with plenty of gas for stoves, boilers, and gas engines and to spare, and with the latter slow drivings, increased coke consumption, variable quality of iron, shortage of gas, and general trouble and discontent.

From a paper prepared for the British Iron and Steel institute. The author, G. D. Cochrane, Middlesbrough, is identified with the Ormesby furnaces.

New Book on Metallurgy

The Atlas Crucible Steel Co. has recently published an interesting little volume written by Gerald W. Hinkley, assistant to the president of that organization. The book is called "A Few Secrets of the Metallurgists Simply Told,'" and deals with the allotropic theory of iron and steel. It is primarily intended for the layman and is therefore nontechnical in phraseology. The aim of the book is to give a brief but satisfactory outline of some of the great principles of metallurgy.

The story is begun with a description of carbon steel. To make his description intelligible to the lay mind, the author compares the mixture to salt water, the iron corresponding to the water and the carbon to the salt. Having established his comparison, we are made to look upon cementite as a saturated solution, and so on through solid solutions and supersaturation. The transition to high-speed steels is made easily and this is followed by a discussion of the effect of the more important elements in tool steels. The last chapter deals with tool steel and its relation to the war. An appendix giving the analyses, uses and heat treatment of various tool steels brings the book to a close.

"The History of Steel Making," a 22-page booklet on the steel industry, is being distributed by the Vulcan Steel Products Co., New York. It traces the iron industry from 4000 B. C. until the present time.

I. W. W. Are Given Heavy Sentences

Haywood and His Aids Must Serve 20 Years in Federal Penitentiary and Pay $20,000 Fines—Five and Ten Year Sentences for Others; Death-Blow to Organization, Prosecutor Says

WHAT federal prosecutors believe was the death blow to the I. W. W. was dealt by Judge K. M. Landis in Chicago, Aug. 30, when he sentenced William D. Haywood, the "uncrowned king" of the organization, and 14 of his chief aids to 20 years imprisonment in the federal penitentiary at Leavenworth and also imposed heavy sentences on many of the other members of the I. W. W. who recently were convicted of treason. With Haywood and the leaders in the penitentiary the government does not expect further fire in the rear from the I. W. W., at least not for the period of the war.

"It is the closing chapter in America's biggest criminal case," said Frank K. Nebeker, chief counsel for the government, as sentences were pronounced by Judge Landis.

In addition to their penitentiary terms, Haywood and his 14 aids were each ordered to pay a fine of $20,000. Ten-year sentences were imposed on 33 members of the organization, five-year sentences on 33, one-year sentences on 12 and 10-day sentences on two others. Fines were imposed on all, ranging from the maximum of $20,000 to a minimum of $5,000. Ninety days were granted in which to file a bill of exception and seven days in which to petition for bail pending appeal. The government will resist every effort to set aside the sentences or to give the men their freedom on bond.

Mixed Crowd at Bar

There was a motley array in court when sentences were pronounced. George Andreytchine, a young Russian poet, who, being expelled from Russia for plotting a revolution, joined the I. W. W. in the United States, blew a kiss to his pretty bride, who waved her handkerchief, as he stepped forward to be sentenced. Manuel Rey, a Buffalo, organizer, who wore a red tie, as a symbol of the I. W. W. flag, during the trial, continued to wear it as he faced the court.

"Twenty years in the penitentiary," was the court's announcement to him.

Benjamin Fletcher, Philadelphia, was the only negro in the group, and he grinned broadly when he was sentenced for 10 years.

"Judge Landis is using poor English today; his sentences are too long," he remarked.

"Big Bill" Haywood, however, was crestfallen.

"In times of peace," said the judge in sentencing Haywood, "you have a legal right to oppose, by free speech, preparations for war. But when the war has been declared that right ceases forthwith."

For more than an hour Judge Landis with sharp direct sentences reviewed the nation-wide conspiracy against the government and read excerpts from Haywood's correspondence relative to opposition to the war.

Skilled Labor to be Taken from Non-War Plants

Every toolmaker and diesinker in nonessential lines of work will soon be put in war production, according to a statement by Nathan A. Smyth, chief of the unskilled labor section of the United States employment service. He also stated that all manufacturers engaged in the production of nonessentials will have to make the same sacrifices as regards labor as they have been compelled to make as regards fuel, steel and other material.

"The war industries of the country are today short about 1,000,000 unskilled workers and the coming requirements of war production necessitate the finding of between 2,000,000 and 3,000,000 more," said Mr. Smyth.

"Similarly, the demand for skilled workers by war industries is greater than the immediately available supplies. Before long we will have to take every toolmaker and diesinker in non-war work and put him in war production. The work of the community labor board in recruiting and distributing labor in its far-reaching effect is more important than that of the draft boards. Those with non-war work must make the same sacrifices as regards to labor that they have made in regards to fuel, steel and other materials. The employment service is backed by the full power of the production agencies of the government. The war industries board and the fuel administration can force compliance. The employment service and its units in the states and communities must be left absolutely free from influences other than that of efficiency. They must be kept free from the influence of one group against another, of one party against another, or one faction against another. They must be truly representative and fair."

Rely on Trade Schools for Skilled Workers

The system of training schools for factory workers is making great progress throughout the country as the demand for skilled workers increases, according to data compiled by the section on industrial training for war emergency of the committee on welfare work, advisory commission, council of national defense. A new list of 75 so-called vestibule schools established by leading industries accompanies the report that the companies concerned are spending upward of $1,000,000 in training operatives. The section estimates that 750,000 new workers must be brought into American factories by Jan. 1 and trained for skilled operation. Following a general meeting of manufacturers in the Philadelphia ordnance district and the report of a shortage there of 50,000 skilled workers, 75 companies in the district either decided on training rooms or are seriously considering the subject.

The system is now offered by the section as the best solution so far devised for the problem presented by the growing scarcity of skilled workers. Reports from factories where the system has been installed indicate that women are coming into the factories in constantly increasing numbers, quick to avail themselves of the opportunities to learn trades. Among those entering one school were three school teachers. In a bulletin concerning the training of tool room operators the section states:

"There is a great shortage in tool room workers but nothing to compare with the possible shortage by Jan. 1. It is commonly reported that our army will be increased 250,000 men monthly and a total of 5,000,000 men is coming to be considered as well inside the possible limit. Many of our greatest plants are either not yet built or not manned.

Priority in War Industry

First Installment

The Priority System

What It Is - - - What It Does

Its Basic Principles Are Explained

BY C. J. STARK

Editor, The Iron Trade Review

WAR has put a powerful new word in the vocabulary of American industry. Practically no business transaction today may be carried out without it and what it stands for, receiving the first consideration of both buyer and seller. This is actually and peculiarly true of iron and steel which is in such tremendous demand for the purposes of war.

This all-important word is priority What is priority?

In the language of Webster, it is defined as "the quality or state of being prior, or of preceding something." In a business sense it is all of this and more.

Six months ago the occasions for the use of the word and of the system for which it is the common denominator were comparatively few. Today official records at Washington show the individual cases where it has been formally applied have reached well over the 100,000 mark. Where it has been observed in delivery without calling upon Washington for formal action, the number is beyond estimate. Undoubtedly this total is equally as great as that of the recorded cases. This wide recourse to the plan and its purposes effectively portray the extent and the rapidity by which the government has become the third party in the everyday trade of the manufacturer, the jobber and the dealer.

Priority has descended to us from the English by whom it was devised as an effective instrument by which an industrial nation makes war; or perhaps it should be said by which an ill-prepared industrial nation makes war. For in the latter case, the demands upon the industries of the country and hence the need of applying their resources in the most effective manner, is all the greater. Likewise the dislocation of normal business caused by war is all the more far-reaching.

Priority in war aims at such distribution of raw materials or supplies as will serve most effectively military and essential needs in the order of the latter's importance to the general undertaking, which is the conduct of the war. Carried to its logical end, it aims at the quickest execution of that work which is connected in any way with the carrying on of the war. Judge E. B. Parker, head of the priorities arm of the government, calls it "purposeful discrimination." Expounding more fully his conception of priority, he says: "The paramount purpose of priorities is the selective mobilization of the products of the soil, the mines and the factories for direct and indirect war needs in such a way as will most effectively contribute toward winning the war." The underlying motives of the English in creating the priority system were to hasten vital production; to prevent duplication of output or effort; and generally to advance the country's chances of winning the war.

The selective utilization of raw materials and supplies brought about by the priority system in effect produces these results:

(1) It prevents competition for a given supply of an indispensable material among demands which may be of equal importance to the prosecution of the war or unequally so.

(2) It prevents conflicts and delays in getting supplies for manufacture and hence maintains or increases production of an essential character.

(3) It classifies uses or purposes according to their war or essential character and therefore operates to differentiate between various lines of production.

It will be well to bear constantly in mind the fundamental fact that priority is regulated by the purpose to which supplies and materials are to be put. It represents a rating of that purpose.

The American priority system while patterned after that of the English, is dissimilar in many respects since it was found that basic conditions in the latter country made its application here difficult or virtually impossible. The American plan has been worked out to meet the conditions as they exist in this country. Therefore it is purely American in its form and in its operation.

All orders and work under war conditions have been divided into five distinct classes as follows:

AA—War work of an emergency character.

A—Other war work of a direct character.

B—Indirect war work and work es-

Essentials of Priority

PRIORITY is a rating.

It is applied to material and supplies for war or essential work.

The material and supplies must be under order for the producer of war or essential work.

The aim of priority is to expedite delivery of requirements for war or essential work.

Priority is not expected to be resorted to unless normal distribution will not furnish the necessary delivery.

It is regulated by the importance under war conditions of the purpose to which material or supplies are to be put.

sential to the public welfare.

C—Work coming under the general purposes list or the general preference list which has been especially compiled by the government authorities.

D—All other work not included in AA, A, B, or C classes, namely general commercial work.

To further carry out the idea of expediting delivery by preventing conflicts and delays, the classes AA, A and B are subdivided within themselves in accordance with the nature or urgency of the demand. This is done by the use of suffix number. Thus orders which have a rating of purpose designated as AA-1 take precedence over AA-2 orders as well as over orders included within the A and B classes; A-1 work has preference over A-2 or A-3 work or over B work, etc. This rule of precedence does not mean that the execution of these orders shall be in the rotation of their classes and priority numbers. It is the purpose of the system to interfere with economical manufacturing operations as little as possible. Its cardinal aim is to insure the promptness of delivery of all war or essential work as ordered, and the rating or classification is to show the producer which work is considered of the greater importance. The precedence in rating is expected to be called into use only where it is necessary to insure the delivery stipulated by the respective orders.

Necessity Supplies the Rule

Upon this point Judge Parker says clearly "The classification of orders simply means that they shall be given such precedence over orders of a lower classification as may be necessary—and only such as may be necessary—to insure delivery on the date specified in the order. Such classification does not mean that work should cease on orders of a lower classification, or that the order should be completed and delivery made in advance of orders taking a lower classification, if this is not necessary to effect delivery within the time specified.

"The producer of raw materials or manufactured products to whom a priortiy certificate is directed should make his own production plans so as to get the maximum of efficiency out of his operations, making all deliveries at the time contracted for, if possible, but where it is not possible, giving precedence to the orders taking the highest classification.

"When a manufacturer finds that a large per cent of the capacity of his plant is covered by certificates of the same subdivision of a class, he should call this situation to the attention of the priorities committee so that if desirable his schedule may, in conference with such manufacturer, those placing the order and the priorities committee, be either reclassified or the schedules within each subdivision of a class rearranged and regraded so as to insure the most urgent orders having precedence without unnecessarily interfering with the efficient management and operation by the manufacturer. The committee stands ready at all times on proper notice to reconsider and regrade individual schedules in conference with all parties at interest."

Delivery as the Test

If a producer can make the delivery required by the various orders, he may proceed with the execution of all AA, A, B and C orders or in remote cases possibly D orders up to five tons, regardless of their classification, as the delivery is the controlling thing. Distribution of D orders of more than five tons is subject to further restrictions, such as the issuance of a special permit by the steel director, etc. Where respective delivery obligations can be met, B or C orders may be got out before AA or A orders, etc. When and if, however, the execution of a producer's various orders conflict, those taking the highest rating shall have prior call upon his productive capacity. If two orders of the same subdivision of a class, as for example A-1 conflict in delivery, the dates of the orders will determine the precedence. The one first placed shall supersede. If, however, one of the orders calls for an earlier delivery than the other, even though it was placed on the books of the producer at a later date, it will have the right of way. These general rules of precedence, of course, are subject to modification by the priorities committee in exceptional cases. Rerating of individual orders to avoid conflicts and to push ahead the most desired orders, is made by the committee whenever proper cause is shown.

Priority rating under the present government plan is given in two ways: (1) by the issuance of priority certificates on the application of the user to the priorities committee at Washington; (2) by the application by the user of automatic ratings to his own work in accordance with prescribed rules laid down by the priorities board.

Only work included in the three classes AA, A and B may be granted a priority certificate under the present system. Automatic priority also is limited to classes AA, A and B. Orders falling under the C classification, which, it will be noted, represents essential work, may be raised to a priority rating, however, whenever it is shown that it is important that they should be so advanced; and where it is shown that under their original C classification their delivery would be so indefinite or delayed as to present their completion on time or block other important contracts to which they are related.

A priority certificate is a formal authority granted by the priorities committee to an individual user to enable the latter to get material or supplies with which to complete his war or essential orders at the time of delivery specified. Application for such a certificate is to be made only after the user has made every reasonable effort on his part to assure delivery of material or supplies from the producer with whom he has placed his order. Issuance of such a priority certificate means that the government is convinced the particular user needs its assistance, in getting delivery otherwise essential work upon which he is engaged would be subject to indefinite delay. The burden is upon the applicant therefore to establish the fact that such special aid is needed in his case. The need for the priority certificate or what it implies, the assistance of the government in getting prompt delivery of material or supplies under order, has been found to exist in many cases.

Steel Priorities Numerous

It is evident, however, as the system works out, that not all the war or essential work now being produced in the country is covered by a formal priority. In fact it is not contemplated that all work of this character should require priority rating. A definite priority rating it usually follows signifys that there is a necessity for it and not that all war or essential orders must be given a priority certification to establish their standing of essentiality. It is clear that the priority certificate is called into play most freely where the demand for a particular thing, as for instance, any product of steel, exceeds the supply. Priority assistance as a rule is not given unless the order which it is to expedite, has been actually placed with the producer.

To sum up the underlying purpose of the priority system is to insure manufacturers of essential products that they will receive their needs of material and supplies under order as required. It imposes upon the user, however, the obligation of determining whether actually there will be a delay in the receipt of his requirements before he may come to the government with clean hands and claim the latter's assistance.

Zone Plan

Refractories Distribution May Not Be Used—Standardization Urged

Pittsburgh, Sept. 3.—An active demand still is noted for the leading grades of refractories the principal calls coming from the iron and steel industry. Production is running between 80 and 90 per cent of capacity, a scarcity of cars and of labor preventing full operation. There has been no change in prices and nothing new has developed in connection with the plan of better and more expeditious shipments by means of a zone system. Although zone plans have been drawn up, it is doubtful if they will be put into effect, as there is now little business that calls for long distance shipments. The plan will be held in readiness in the event that an exigency may arise.

Refractories

(Per 1000 f. o. b. works)

FIRE CLAY BRICK.

(First Quality)

Pennsylvania	$45.00 to 55.00
Missouri-Illinois	55.00 to 65.00
Ohio	45.00 to 50.00
Kentucky	45.00 to 55.00
New England	55.00 to 65.00

FIRE CLAY BRICK

(Second Quality)

Pennsylvania	$40.00 to 50.00
Ohio	35.00
New England	48.00 to 58.00

SILICA BRICK.

Pennsylvania	$50.00 to 60.00
Chicago	55.50 to 65.50
Birmingham	45.00 to 55.00

MAGNESITE BRICK

(Per Net Ton)

9 x 4½ x 2½	$110.00 to 130.00

CHROME BRICK

(Per Net Ton)

9 x 4½ x 2½	$135.00 to 140.00

BAUXITE BRICK

(Per Net Ton)

55 per cent	$40.00 base
76 per cent	100.00 base

The industry is feeling the loss of skilled help to a considerable extent and in order to overcome it as much as possible, Charles Catlett, chairman of the refractories section of the chemicals division of the war industries board, has issued an appeal to the trade for a standardization of shapes and sizes. Attention is drawn to the big demand and the slight possibility of there being any immediate decrease in the country's requirements. Indeed, it looks as though there would be a further increase in wants and they must be met with a smaller force of men than usual.

It is of the utmost importance, the letter says, in order to insure prompt delivery of satisfactory material that consumers of fire brick and refractories adapt themselves as far as possible to the use of standard shapes. It is suggested that all new contruction and repair work be adapted to standard specifications as to shapes. Manufacturers of special shapes and sizes are asked to reduce the number of them. The letter also points out that there are plants belonging to one company that cannot exchange supplies because of the slight differences in the sizes used.

The trade is warned that it will be far more difficult to secure co-operation in the matter of priority shipments where special shapes are called for when standard shapes easily could be made available. Manufacturers are directed to investigate and determine where it is possible to substitute standardized for special shapes and to act promptly on the results of such investigations.

Company Loses Contract, Strikers Blamed

Because of labor troubles, which recently culminated in a four-day strike, the Milwaukee Dry Dock Co., Milwaukee, has been relieved of its contract to rebuild the steamer CASTALIA, of 4000 gross tons, by the United States shipping board. The boat will be sent to another yard. The Milwaukee company will be allowed to complete its contract for rebuilding the steamer FRONTENAC, a vessel of similar tonnage. Government representatives do not blame the Milwaukee company, which, they say, has been paying maximum wages. The men receive 10 hours' pay for nine hours' work. An investigation of the origin of the trouble will be made and criminal charges may be brought against the men who are believed to have caused the trouble.

To Build Steel Vessels

The Universal Shipbuilding Co., Sturgeon Bay, Wis., has taken over the entire plant and equipment of the Hess Iron Works, Inc., Green Bay, Wis., and will erect several new buildings to accommodate a transfer of the works to its shipbuilding plant. W. J. Hess, general manager of the Green Bay company, joins the Universal yards as superintendent of fabricating and erection and boiler manufacture. The machinery, equipment and materials probably will be transported from Green Bay to Sturgeon Bay by means of scows across Green Bay. The purchase of the Hess Iron Works will enable the Universal company to accept contracts within a short time for steel vessels. The Universal plant is that formerly owned and operated by Rieboldt & Wolter, who build wooden vessels exclusively. It is now building three ocean-going tugs, with wooden hulls, for the government. These tugs will be 150 feet long, with 30-foot beam and 16½-foot draft.

Launch Steel Cargo Ship on Welland Canal

Toronto, Ont., Aug. 31.—The first of the steel ocean-going cargo vessels built on the Welland canal for the imperial munitions board has been successfully launched. The ship was constructed in the yards of the British-American Shipbuilding Co., and is 261 feet long. It will be outfitted at the plant and is expected to be ready for service this fall. A second ship is also under construction at the plant and a third will be started immediately on the stocks vacated by the completed ship.

Lengthens Coal Bridge

Due to the shortage of structural steel, the Wisconsin Coal & Dock Co., Milwaukee, has resorted to the unique expedient of lengthening its coal bridge at its National avenue dock by inserting a 30-foot section, instead of erecting an additional bridge, as originally intended. The company was able only to obtain half of the steel necessary to build a new bridge. Therefore it was decided to lengthen the present 300-foot bridge to 330 feet. The work will cost about $30,000, whereas a new bridge would have involved an expenditure of nearly $125,000. The job is being done by the H. E. Birkholz Co., engineers, Merchants & Manufacturers bank building, Milwaukee,

A metal suitable for the finest cutlery has been developed from combing iron, chromium and cobalt, according to an announcement by Professor W. L. Goodwin, of Queen's university. It is reported that the new metal is easy to work and will shortly be placed on the market in commercial quantities. Professor Goodwin is chairman of the Canadian section of the Society of Chemical Industry, which organization, in conjunction with the Canadian Chemists and Chemical Engineers, is trying to obtain more useful substances from ores and waste products.

Incorporated at $300,000, the Wentworth Mfg. Co., Ltd., Hamilton, Ont., takes over the business and assets of the Wentworth Brass Co., that city. It manufactures brass and copper products and operates a brass, bronze and aluminum foundry.

Canadian Unions Force Up Wages to Record Level

Toronto, Ont., Sept. 2.—One hundred and seventy employes of 17 firms in Toronto recently went on strike, members of the International Brotherhood of Blacksmiths and the Amalgamated Society of Engineers forcing nine of the firms to agree to the highest wage scale for their occupations in Canada. Eight of the firms refused to accept the terms, their employes returning to work pending settlement by a board of conciliation. The agreement signed by nine firms provides a minimum wage of $1 an hour for a 9-hour day for men working on heavy forges, time and a half for overtime until 10 p. m., then double time, and double time for all work on Sundays and holidays. Blacksmiths on general work will receive 70 cents an hour and those on heavy fires will receive 80 cents while helpers will receive from 50 to 60 cents.

On Aug. 21 the Quebec bridge was subjected to a severe test preliminary to its being taken over by the Canadian government. In the presence of several thousand spectators, two large trains loaded to capacity and weighing approximately 14,000,000 pounds, steamed out over the central span where their weight was allowed to rest on the span simultaneously, without any apparent effect on the structure. Among the railroad and other officials present were Chairman Montsoviat, of the government bridge commission; Gordon Grant, chief engineer of the Transcontinental railway, and Judge E. H. Gary, chairman of the United States Steel Corp. The test was satisfactory to the Canadian railway department and the bridge will be formally taken over within a few days.

Manufacturers Will Organize

Plans for the formation of a national federation of manufacturers along the lines of the American Federation of Labor have been announced by Warren C. King, president of the Manufacturers Council of New Jersey. Local councils of manufacturers will be organized and these will be subservient to state councils which in turn will be subordinate to the national body. Mr. King said that the originators of the plan expect to enroll all of the country's manufacturers. Temporary headquarters have been opened at 72 Front street, New York. Mr. King made the following statement: "The need for a new plan of organization among the manufacturers of the country necessitated both by the emergency of war and the situation at the end of the war, has been clearly demonstrated. We desire to form the national federation on the lines of the labor organization, not with the idea of combating labor, but with the idea of co-operating with labor."

Machinists Strike Against War Board Award

About 5000 machinists have gone out on strike from a number of plants in Bridgeport, Conn., in protest to the award of the war labor board which increased all the wages under 78 cents an hour, but did not establish any rate above that. Minimum rates were established at 42 cents for skilled or unskilled men and at 32 cents for women over 18 years. The award does not change the wages of machinists as asked for by the union.

The award was announced by Otto M. Eidlitz, who was appointed umpire by the war labor board. The strikers met Aug. 30 and voted to call out the workers in all shops in Bridgeport, including a number of small shops which entered into an agreement with the local lodge of international machinists to pay the minimum rate of 80 cents an hour for toolmakers and 70 cents for machinists. This agreement included the machinists of the Lake Torpedo Boat Co., which previously had been outside of the controversy as its employes are under the jurisdiction of the shipping board.

Installs Furnace

The Industrial Electric Furnace Co., Chicago, makers of the Snyder electric furnace, is installing a 5-ton furnace in the plant of the Zimmerman Steel Co., Bettendorf, Ia. It is a three-phase furnace, designed for acid operation, and will be used for general work. The furnace will replace a converter.

Obituaries

ROBERT Schuttler Hotz, grandson of Peter Schuttler, founder of the wagon business bearing his name, died in Chicago, Aug. 26, aged 48 years. He was interested in the wagon building industry until a few years ago when he retired. He was a member of the Yale club of New York, the Chicago club, the Chicago Athletic association, etc.

H. W. McCandless, vice president of the Weir Frog Co., Cincinnati, died Aug. 21 at a summer resort in Michigan, where he was spending his vacation.

Albert N. Fogel, Dorchester, Mass., was killed in action in France. Prior to his entering the service he was for 12 years with Richards & Co., Boston, metal workers.

John G. Wright, New York manager of the Hooven, Owens, Rentschler Co., Hamilton, O., died Aug. 25, at his home in White Plains, N. Y., from pneumonia.

Willis L. Brownell, formerly treasurer of the Crocker-Wheeler Co., East Orange, N. J., died Aug. 11 at his home in Manchester, Conn., aged 72. He retired from the above connection three years ago.

Walter Birch, formerly purchasing agent for the Westinghouse Lamp Co., was instantly killed Aug. 28 when he attempted to board a train at East Orange, N. J. Mr. Birch was 32 years of age.

Louis A. Hutchinson, aged 50 years, who for a number of years was cashier at the Lucy furnaces of the Carnegie Steel Co., died recently at Bemis Point, N. Y., where he had gone on a vacation.

Samuel A. Newman, president of the Ohio Iron & Steel Co., died in a hospital at Chicago, Aug. 22. He was born in Cleveland, and was 41 years of age. He was a director of the Chicago Association of Jewish Charities.

Clarence J. Luther, founder and president of the Luther Grinder Co., 285 South Water street, Milwaukee, died at his home in Poynette, Wis., Aug. 8, aged 53 years. Mr. Luther designed the tool grinders and other mechanical appliances made by the company.

Lieut. Clifton Irving Sutton, who was killed in an airplane accident at Issodun, France, on Aug. 16, was a son of John A. Sutton, first vice president of the Crucible Steel Co. of America, Pittsburgh. Lieutenant Sutton was 29 years old and had been engaged in the real estate business prior to entering the army.

Will Simplify Needs of Ship Steel

Movement Towards Standardization of Ship Types Probably Will Carry With it Reduction of Steel Sections and Sizes—Will Permit More Centralized and Efficient Mill Operations—Expect Allocations to be More Satisfactory

WASHINGTON, Sept. 3.—Charles M. Schwab, director general of the Emergency Fleet corporation, recently took up with Edward N. Hurley, chairman, and other officials of the shipping board and the corporation, the question of standardizing the 91 types of vessels now being built by or under the supervision of the government. This is regarded as one of the best moves which can be effected by the director general and to the industries of the country, particularly the steel manufacturers, this proposed course is highly significant.

Construction of 91 types of ships, in addition to causing a scattering of effort on the part of the shipping board and the Fleet corporation, presents problems to the manufacturers of ship material which are as equally divergent. Not only does the plan contemplate reducing the number of types of boats, it is stated at the shipbuilding headquarters here, but it is expected arrangements may be made by which the number of sizes of sections in each ship will be reduced to a minimum, calling for more centralized production.

Many Steel Sections Needed

To the steel mills of the country this action is important. At present, officials of the Fleet corporation declare, there are more than 60 sizes and types of sections of steel required in the construction of the various kinds of ships now on the ways and under contract. While the authorities are reluctant to discuss the subject, they have let it be known that this figure will be cut to approximately a dozen.

This action undoubtedly will be welcomed in the steel industry, both by producers and by fabricators. It is evident the steel shipyards will be grateful for such standardization as will limit the number of sizes and the varying shapes of the sections entering into the hulls of the ships. This action likely is to mean fewer sizes of plates, for example, will have to be rolled in the mills and this in turn will simplify the handling of plates and shapes in the fabricating plants. The result in the shipyards is obvious.

Another thing which this course probably will bring about, will be more universal satisfaction with the present system of allocating steel tonnages among the mills. The allocations are handled for the government by the industry itself, through the American Iron and Steel institute, and the system has been approved by the war industries board and J. Leonard Replogle, the board's director of steel supply.

Some Allocations Unfavorable

Urgent demands for steel in certain localities, the condition of the mills which might fill the orders, the question of transportation, and other points, mostly technical, make for allocations which may be unfavorable to the mills receiving them. Numerous complaints have been made to the institute and to the war industries board concerning certain allocations, but few if any of the latter have changed when the conditions pertinent to the placements have been explained.

For example, an Atlantic coast shipyard requires an urgent shipment of 60-inch plates. Practically all the mills of this size are booked to capacity on orders equally as urgent. The next available 60-inch mill is in the Chicago district. But the time and transportation involved make the allocation to that mill unsatisfactory to the government and instead the 60-inch order is placed with a company at Philadelphia for rolling on a 110-inch mill.

Steel men recognize the unfairness of such an allocation and dissatisfaction on the part of the manufacturer is likely to be expressed in unmistakable terms. In peace times, when mills could exercise choice, such an order would be refused. The order might even be refused today if the mills could have final say in the matter, but the government, and the institute also, sees the urgency of the order and realizes dissatisfaction likely will arise. But apparently there is no other course open and the order stands.

Mill operators generally realize the conditions warranting such an allocation and the dissatisfaction the system causes is negligible compared to the apparent willingness of the mills in accepting the orders for millions of tons of steel. They recognize the difficulties incumbent upon the institute in handling the matter of placing orders and expressions made by steel men from time to time are full of praise for the general fairness and quick dispatch in making allocations.

This allocation problem applies to other materials than steel. The lumber industry has been beset with troubles of this nature and the war industries board has been called upon innumerable times to settle placement questions. Practically all divisions of the board have had the same troubles with the commodities over which they have supervision. An official of the board recently declared it is impossible for allocations, based on the many factors entering into the war emergency, to be made to the satisfaction of all.

In addition to standardizing the number of types of vessels now being built, the Fleet corporation also is slowing down on the construction of new yards and new ways. Mr. Schwab, just before leaving last week for an inspection tour of New England plants, declared he intends "to keep all the wood shipways of the country going, although the Emergency Fleet corporation will not have any more wood shipways built." While no expression has been made publicly, it is said the same policy holds good as to steel shipways.

This decision is brought about mainly because of the labor, transportation, and production ploblems. As has been stated in these pages before, the various war branches of the government realize the futility of overproduction in certain lines when the utility of the products is brought to naught through the inability of completing operating units. In other words, why build ways and ships when the manufacturers of machinery, equipment, engines, etc., for vessels, can supply only a limited number in a given time.

Issue New Regulations in Tin and Terne Plate

Washington, Sept. 3.—New regulations are announced by the war trade board governing the issuance of licenses for the exportation of tin and terne plate and the manufactures of tin. Applications

for licenses to export tin plate will only be received from the manufacturer or direct purchaser from the manufacturer. In the latter event, a copy of the contract must be filed with the application. All applications to export tin plate are to be accompanied by form X-4. Exportations of tin plate to Canada will be considered, when the applicant furnishes satisfactory evidence that the material is to be used for a purpose for which it may be used within the United States. When exporting tin plate to North and South America (except Canada and Newfoundland) and to Bermuda, West Indies, Falkland Islands, Galapagos, Aleutian islands, China and Japan, exporters must furnish satisfactory evidence to the war trade board that the tin plate will be actually consumed in the manufacture of:

(a) Containers for food to be consumed by the people of nations at war with Germany, or by the people inhabiting the country in which the food is packed;

(b) Containers for food or alcohol to be used by the owners and employes of manufacturing plants, mines or oil wells, the product of which is necessary to and actually aids in the successful prosecution of the war, or is exported either to the United States or the allies;

(c) Cans to be used by oil refiners as containers for oils, gasoline, etc., when furnished to the United States or the allies in large lots.

All such applications are to be accompanied by satisfactory evidence as to the existence of an order from the actual purchaser abroad.

Similar regulations apply to the exportation of manufactures of tin. Form X-4, however need only accompany license applications to export type metal, printer's type, dental alloys and sundry articles made of tin plate or coated or dipped in tin.

Bearing antifriction and white metals and tin alloys, containing over 5 per cent tin; solder, containing over 40 per cent and tin foil, collapsible tin tubes and bottle caps or covers of tin foil, containing over 5 per cent of tin, may be exported to Canada or Newfoundland. (1) upon it being shown they are to be used for similar purposes as in the United States and that the tin content is not higher than is requisite for the destined purpose; (2) that when the destination is other than Canada or Newfoundland, they will contribute to the successful prosecution of the war; (3) that the tin content does not consist of Straits or Banca tin; (4) when the tin content is 5, 40 or 5 per cent respectively or less, applications for export must be accompanied by affidavits giving the tin content. Restrictions are made of exports of second-hand crushed oil cans, block tin, in a manufactured article or machine; phosphorized tin, tin crystals, tin oxide, tetrachloride of tin, bichloride of tin to Canada; bottle caps and covers or closures made of tin plate.

Locomotive Capacity Will Be Expanded

WASHINGTON, Sept. 3.—The war industries board has approved expansion of the railroad locomotive building industry to the extent of doubling present capacity. This action raises the output of the country's shops from 300 locomotives annually to 6000 and is taken in order to meet the demands of the American railways in France, the railroads in this country and the requirements in other parts of the world dependent upon the engine builders of the United States.

Details of the arrangements have not been disclosed, but it is evident the industries board has been assured sufficient raw materials, including steel and coal, can be provided to meet the locomotive construction schedules. This means, of course, more steel will be allocated to the locomotive builders, not only for manufacture of railroad motive power but for the construction of plants which must come before the increased output can be realized.

Will Extend Present Plants

The expansion of the engine building industry is to come through the construction of additions to present facilities rather than in erection of entirely new plants. This policy is practically true of all expansion programs on which governmental approval is needed. Whether the railroad administration, the war finance corporation or the locomotive builders themselves are to finance the new program has not been stated, but it is likely some general plan involving the three possibilities will be worked out.

Some time ago, at the railroad administration it was stated several millions would be spent in enlarging the Lima Locomotive Corp.'s plant at Lima, O., to increase the output there from more than 360 annually to considerably more than 600. This would leave more than 2750 additional to come from the plants of the Baldwin Locomotive Works and the American Locomotive Co.

Following a meeting with the locomotive builders, the war industries board emphasized the following statement:

"At a meeting of representative locomotive builders with Bernard M. Baruch, chairman of the war industries board, and other officials of the board, the railroad administration and the government departments, one of the heaviest problems connected with the direction of war work—an adequate supply of railroad locomotives—was solved.

"Plans were worked out whereby the output of the American locomotive manufacturing plants will be doubled, the increase being from more than 300 on a pre war basis to more than 6000 completed machines. An equal distribution of the output to meet the military needs in France and the needs of the railroad administration for the steam roads of the United States has been provided by the chairman which has met the approval of the government officials directly involved.

"Among those attending the meeting were Samuel Vauclain, of the Baldwin Locomotive Co.; Mr. Fletcher, president of the American Locomotive Co.; Mr. Lassiter, general manager of the American Locomotive Co.; Colonels Tyler and Wright, of the army engineers corps; Assistant General Manager Hines; Director of Operations Gray, and Director of Railroad Equipment, J. R. Flannery, of the railroad administration, and Henry Rea, of the committee on munitions and plants."

Fleet Contract Goes West

The Emergency Fleet Corp. has awarded another large contract to the Pacific Steel & Boiler Co., Tacoma, Wash. Rush work on the order will commence as soon as the material is delivered in November. Until the material arrives the large plant of the company here will be turned over to the manufacture of Pacific boilers. Officers and principal owners of the company are O. T. Nelson and A. H. Chrisman, both of Seattle.

Preparing to Build

The Baldwin Locomotive Works, is preparing to build a plant on property it has owned several years at East Chicago, Ind. G. W. Sample, Jr., is engineer in charge of construction. The company put in a foundation and considerable trackage several years ago and then ceased building. This wrk will be utilized in the new plant.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

THOMAS C. WARD has been elected president of Hickman, Williams & Co., Inc., iron and steel brokers, succeeding H. L. Williams, Chicago, who asked to be relieved from active service. Mr. Ward has been associated with the company for 15 years, and opened its office in Pittsburgh, later becoming vice president and director. He was born in Louisville, Ky., in 1879. His first business connection after graduation from the Polytechnic institute of Brooklyn, N. Y., was with the Birmingham Rolling Mills, Birmingham, Ala., where he was employed as a shipping clerk. Subsequently he became yardmaster and assistant superintendent of blast furnaces for the Sloss-Sheffield Steel & Iron Co., Birmingham, after which he went with the company of which he now is president.

Pittsburgh now becomes the company's executive office with Mr. Ward in charge.

L. J. Voyer has been named general manager of sales of the Liberty Steel Co., Warren, O.

Andrew Carnegie has returned to Shadowbrook, Lenox, Mass., from Bar Harbor, Me., where he spent the month of August.

George D. Brittain, secretary-treasurer of the Mobile Shipbuilding Co., Mobile, Ala., has been made treasurer of the Birmingham Steel Corp., Birmingham, Ala., which formerly was the Armor Iron & Steel Co.

Latham McMullin was recently made manager and placed in charge of the recently-opened branch office in San Francisco of the Q. & C. Co., New York, manufacturer of rail joints.

Finn Hannevig, brother of Christoffer Hannevig, president of the Pusey & Jones Co., Wilmington, Del., has been appointed vice president and manager to succeed C. Stewart Lee, who resigned recently.

Joseph B. Reid, who for the past 20 years has had charge of the shipping department of the Coe Brass Co. branch of the American Brass Co., Torrington, Conn., was recently transferred to the company's Buffalo factory for special work.

John H. Howard, Chicago, was recently appointed manager of a new department of the federal railroad administration which will have supervision over all freight claims against the railroads under government control.

Thomas C. Ham, who is connected with the wire department of the Jones & Laughlin Steel Co., Pittsburgh, has been made secretary of the manufacturers' division of the fourth Liberty loan campaign committee, in that city. B. F. Jones, Jr., president of that company is chairman, and A. V. Davis, president of the Aluminum Co. of America is vice president of the committee. Mr. Ham has been an active worker in connection with Red Cross and other campaigns relating to war activities and as a four-minute man has done a great deal to arouse the patriotism of workers at iron and steel and other plants in the Pittsburgh district.

THOMAS C. HAM

Arthur Aigeltinger was recently elected president of the American Malleable Co., Lancaster, N. Y., to succeed A. S. Blagden upon the latter's resignation to become vice president and general manager of the Air Reduction Co.

William H. Armstrong, who for four years has been secretary and treasurer of the Mitchell Motors Co., Racine, Wis., retired recently to become president and treasurer of the Armstrong Foundry Co., that city. This concern formerly was the Holbrook-Armstrong Iron Co.

E. S. Davis, formerly vice president and treasurer of the Crown Brass Co., New York, is president of the recently organized E. S. Davis, Inc., which has opened offices in the Singer building that city. It will handle a general line of marine and railway supplies.

J. H. Rossiter, director of operations for the Emergency Fleet corporation, recently stated, while in Los Angeles, Cal., that the government would build a drydock in San Pedro, to aid in warship building in that vicinity which would represent the expenditure of $1,000,000.

D. R. Fithian has been appointed superintendent of the Haselton works of the Sharon Steel Hoop Co., Youngstown, O., effective Sept. 1, to succeed Charles B. Cushwa, resigned. For many years, Mr. Fithian was connected with the Youngstown Iron & Steel Co., which was absorbed by the Sharon Steel Hoop Co.

Herman B. Furlong, adjuster of claims for the McClintic-Marshall Co., Pittsburgh, has been commissioned a captain in the quartermaster's corps. Mr. Furlong has been identified with the McClintic-Marshall Co., for several years. He spent considerable time at the Panama canal, where the company had important work.

A. R. Dufresne, assistant chief engineer of the Canadian department of public works resigned recently to become manager of the St. John Drydock & Shipbuilding Co., St. John, N. B. He is a member of the Engineering Institute of Canada and also of the American Society of Civil Engineers.

George V. W. Ingham, who has been a field representative for the Bryant Electric Co. in the central western territory for several years past, has been appointed eastern sales manager, with headquarters at the factory, Bridgeport, Conn. Mr. Ingham will direct the sales activities of the company in the territory east of the Allegheny mountains.

Men of Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

GEORGE M. NAYLOR has resigned as assistant sales manager of T. B. Woods Son's Co., Chambersburg, Pa., and has accepted an appointment as manager of the power transmission division of the Fairbanks Co., 416 Broome street, New York. Mr. Naylor, who is an experienced transmission engineer, will have under his direction this division of the business for all the branch offices of the Fairbanks Co.

Harry B. Chapman, former manager of the Chapman Engineering Co., Texas City, Tex., is now affiliated with the machine plant operated by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

E. R. Wood, formerly eastern representative of the High Speed Hammer Co., Rochester, N. Y., has become associated with the sales department of the Sherritt & Stoer Co., Inc., Philadelphia, machine tool dealer.

H. C. Pope, for several years superintendent of the machine ship department of the Savage Arms Corp., has become assistant to one of the department heads of the government ordnance plant undergoing construction at Neville island, near Pittsburgh.

Wm. C. Willard has been made head of the planning department, recently inaugurated at the plant of the Kilbourne & Jacobs Mfg. Co., Columbus. Before his transfer to the production department, Mr. Willard was plant engineer.

William Harrower, who has been mechanical engineer of the Brewster Co., Long Island City, N. Y., is now affiliated in a similar capacity, with Warneke & Hay Co., Inc., 51 Maiden Lane, New York City. He is a designer of special machinery.

H. H. Leonard, former superintendent of the Turner & Seymour Mfg. Co., Torrington, Conn., has recovered from a serious illness and in September will take up a position with the Stamford Rolling Mills Co., Stamford, Conn.

A. D. Somers who recently resigned as superintendent of the C. J. Root Co., Bristol, Conn., manufacturer of hinges, to go with the H. C. Cook Co., Ansonia, Conn., manufacturer of presses, dies, etc., has been presented with a diamond stickpin by his former associates.

Walter A. Ridings, who has been affiliated with the Porter-Cable Machine Co., Syracuse, N. Y., was recently appointed chairman of the machinery and machine-shop products section of the local section of the bureau of resources and conversion section of the war industries board.

H. W. Knowles and C. W. Yerger, engineers, have been appointed by the Cutler-Hammer Mfg. Co., Milwaukee, Wis., manufacturer of electric controlling devices, to have charge of the recently opened branch office in Washington, located in the Union Trust building, Fifteenth and H streets.

Charles F. Merrill has resigned as chief engineer of the James Hunter Machine Co., North Adams, Mass. He now is affiliated with the southern sales department of the Draper Corp., at Atlanta, Ga. For a number of years, he was connected with the latter company's engineering department at Hopedale, Mass.

Francis A. Erickson, who since January, 1916, has been with the Indiana Steel & Wire Co., Muncie, Ind., resigned recently. He has returned to his former home where for over 16 years he was general foreman for the Morgan Spring Co., before going to Muncie. It is reported that he will resume connections with the Morgan company.

Leonard W. Egan, formerly special engineer with the Wellman-Seaver-Morgan Co., Cleveland, has severed his connection with that concern and has become associated with the Electric Furnace Co., Alliance, O., in a similar caacity. Prior to Mr. Egan's connection with the Wellman-Seaver-Morgan Co. he was for five years electrical engineer of the Pittsburgh Crucible Steel Co., Midland, Pa.

James Jordan, foundry expert for the Charles C. Kawin Co. in Chicago, has been given entire charge of the foundry advisory department of the Charles C. Kawin Co., Ltd., at Toronto, Ont., and Buffalo. Prior to his work with the Kawin Co. he was in charge of the Aultman-Taylor Co., Mansfield, Ohio, and has had 20 years' experience in foundry practice in England and this country.

W. H. Hill, first vice president of the American Radiator Co., Chicago, has assumed the duties of vice president in charge of operations and director of munitions. He has removed from Chicago to Buffalo where he will be in direct charge of the works for the duration of the war. He succeeds A. A. Landon, vice president of the American Radiator Co., who recently was appointed chairman of the aircraft board.

S. F. Bond, electrical engineer, Binghamton Light, Heat & Power Co., who went to Binghamton about a year and one-half ago, has resigned. His place has been filled by W. B. Goudy, formerly superintendent of the New Kensington Light & Power Co., of New Kensington, Pa. The entire electrical equipment, including the power plant and substations will be under Mr. Goudy's jurisdiction, as well as the plant of the Sayre Electric Co., Sayre, Pa.

R. A. Ross, consulting engineer, Montreal, Que., has been appointed by the Canadian government as chairman of the lignite utilization board, which has charge of the construction and operation of a plant in Saskatchewan for the briquetting of lignite coal to produce a commercial fuel. Mr. Ross also is an active member of the Canadian Advisory Council for Scientific and Industrial Research and has devoted much attention to the problem of utilizing the extensive lignite deposits of western Canada.

T. Finnegan, formerly Pacific coast manager of the American Brake Shoe & Foundry Co., New York, has been appointed vice president in charge of the western district with headquarters at 332 South Michigan Ave., Chicago. Mr. Finnegan will have charge of the operating and sales department. A. G. Delaney, formerly affiliated with the Chicago office of the American Brake Shoe & Foundry Co., has been appointed manager of plants and sales with headquarters at Minneapolis, succeeding E. M. Vilas.

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted For Busy Readers

No Income Will Escape New Tax Measure

AFTER many delays and several differences of opinion, the treasury department and the house ways and means committee reached a final understanding on the new revenue bill last week. Several radical changes were made at the eleventh hour but the latest conference between the two bodies was harmonious and the bill, as it was finally shaped up, appeared considerably superior, from a technical standpoint, to the present law. As the bill now stands its salient features, as compared with the present law, which it replaces with a single statute, are:

Personal incomes: Normal tax—12 per cent on income over over $4000 and 6 per cent on income below that figure down to the exemptions, which remain the same as at present, as against 4 per cent and 2 per cent under the present law.

Personal incomes, surtaxes—Greatly increased, doubled and trebled in lower and middle grades.

Corporation incomes—Normal 12 per cent and 18 per cent, the latter on undistributed profits and surplus, as against 6 and 10 per cent in the present law, the latter rate on undistributed dividends.

Corporation incomes—Under the war profits provision, 80 per cent of the profits remaining, after making a deduction of prewar profits plus $3000, either actual, or fixed at 10 per cent if they were less.

Under the excess profits provision—Rates of 35, 50 and 75 per cent on all profits in excess of 8 per cent of the invested capital and $3000, the 35 per cent rate applying between the deductions and 15 per cent net income; the 50 per cent between 15 and 20 per cent income; and the 70 per cent rate on all over that. Excess profits or war profits are to be alternative, according to which will yield the most. Both profits provisions have numerous modifying and qualifying phrases.

Estate inheritance taxes—More than doubled.

Tobacco, cigars and cigarette taxes—Doubled.

Alcohol and all alcoholic liquors—Doubled.

Special taxes heavily increased and a long list of special and luxury taxes added, including some stamp taxes.

The eleventh hour changes mentioned included the elmination of all discrimination between earned and unearned income. The addition tax of 6 per cent on undistributed profits shall not apply to such portions of profits and surplus as are devoted to debt paying. The "catch" clause intended for all corporations having a capitalization of $1,000,000 or more that might not be reached properly by the excess profits or war profits measure, was cut out.

There was every indication at the close of last week that the bill would be disposed of within a week or 10 days. Secretary McAdoo was reported as anxious to have it cleaned off the slate before the opening of the fourth Liberty loan drive. The bill as now devised will affect either directly or indirectly every person and business concern in the United States. It does not impose consumption taxes or a higher tariff, yet is expected to raise practically all of the $8,000,000,000 required.

Financial Crop Ends

Increases in capitalization of recent date include the following: Invincible Metal Furniture Co., Manitowoc, Wis., from $40,000 to $100,000; Decatur Brass Works, Decatur, Ill., from $25,000 to $50,000; Moline Engineering Co., Moline, Ill., $5,000 to $20,000; Holt Trading Co., Huntington, Conn., formerly the Norwich Construction Co., Norwich, Conn., from $50,000 to $150,000, and the Marine Iron Works, Chicago, $75,000 to $150,000.

At a recent meeting of the stockholders of the Traverse City Motor Car Co., Traverse City, Mich., it was decided to change the name to the Napoleon Motors Co. An increase in capitalization from $150,000 to $500,000 was also authorized. The following officers were elected at the meeting: W. J. Chase, president; C. E. Culver, vice president; Frank Trude, secretary-treasurer, and J. W. Oswald, general manager and chief engineer. The company is now engaged in turning out 1-ton and 1½-ton trucks and expects to increase its production by Sept. 1.

The Holland Core Oil Co., 2012 Austin avenue, Chicago, has placed in operation a new plant for the manufacture of core oils. It is modernly equipped throughout and is designed to insure continued uniformity of product. The buildings are of fireproof construction and the warehouse in connection with the plant has a storage capacity of 5000 barrels. The output in one shift of eight hours is 114 barrels.

Breaks Punching Record

A new record for holes punched singly in 10 hours has been made at the plant of the Ferguson Steel & Iron Co., Buffalo, where 16 steel barges for the United States railroad administration are being fabricated and assembled. A. Rostowicy, punched 18,624 holes in 10 hours, most of the holes being about 4 inches apart. This breaks the record held by Charles Milburn at Chicago, who several years ago punched 18,310 holes in 10 hours. Mr. Rostowicy's record means that he punched 31 holes a minute, or at the rate of one hole every two seconds throughout the ten hours. P. A. Comer, shop superintendent of the Ferguson company, awarded to Rostowicy the prize which was offered for a new record for hole punching.

Sweden's Exports of Iron Products Declining

Approximately 7500 tons less of iron and iron products were exported by Sweden in the first quarter of 1918 than in the corresponding period of 1917. This is developed in a published report, presented to the Association of Ironworks at its meeting at Stockholm. The greatest reduction is in connection with hammered and hot and cold rolled or cold drawn bar iron. Whereas in the first three months of 1917, the total tonnage of these products exported was 26,200, for the corresponding period this year, it was 15,600. Another reduction is in the

tonnage of ingots, blooms, and solid tube blooms as from 4500 tons in the first three months of 1917 to 2800 tons in January, February and March, 1918. On the other hand, exports of pig iron increased from 41,400 tons for the first quarter 1917 to 43,400 tons for the first quarter this year. Another increase was in bar ends, rough bars, billets and hollow blooms as from 9900 tons to 13,300 tons. The tonnage of plates and sheets was reduced from 1700 to 1400. Imports of pig iron showed a decrease of 16,700 tons. The total exports of iron ore for the first quarter of 1918 were 347,000 metric tons.

The following table shows the number of blast furnaces and hearths existing and those in operation March 31, 1918:

	March 31, 1917		March 31, 1918	
	Existing	Operating	Existing	Operating
Blast furnaces	131	106	139	108
Lancashire hearths	233	143	241	150
Bessemer furnaces	24	5	24	7
Open hearth furnaces	83	60	87	56

The following table gives the production tonnages of pig iron, blooms, etc., in the first quarter of 1917, compared with the corresponding period of this year:

	1917	1918
Pig iron (inclusive of directly produced castings)	202,800	206,600
Blooms and rough bars	28,100	28,100
Bessemer and Thomas ingots	15,500	14,300
Martin ingots (inclusive of scrapped castings)	127,100	112,300
Crucible ingots and electric ingots	.....	2,200
Rolled and hammered iron and steel, ready for market	91,800	84,800

Pittsburgh Shortage Large

In an address last week before members of the Pittsburgh chamber of commerce, Charles Zeublin, of the United States department of labor, said that from 20,000 to 40,000 industrial workers are needed to fill up the shortage in Pittsburgh for workers' ranks and that nearly 100,000 are required in the state to supply the shortage in essential industry. He read a telegram from Washington saying that the government is planning to send 30,000 men to Pennsylvania to meet this emergency. Mr. Zeublin made a plea with Pittsburgh business men and manufacturers to do all that they can to supply the shortage existing here from among their own forces now engaged in nonessential employment rather than bring any men from a distance. The speaker declared that between 90 and 95 per cent of Pittsburgh's industries are engaged on war work of some nature. Mr. Zeublin told members of the chamber of commerce that this city will commit an economic blunder if it loads up on outside labor. The employment department of the United States Steel Corp., ordnance department, is said to be making efforts to get 3000 skilled workers before the end of the present week for the gun plant being built on Neville island. This labor is being sought through the United States employment service.

Will Become Hospital

Alfred I. duPont, head of the organization which recently acquired the Grand Central Palace, New York, for use as a foreign trade headquarters, announced that as a result of a request by the government, the building is to be used as a war hospital. All tenants have been notified to vacate, but the government will not occupy it until Oct. 1, thus making it possible to hold the fourth national exposition of chemical industries, scheduled to be held there Sept. 23 to 30.

Buys Coking Coal Land

Beaumont, Tex., Sept. 2. — Another step in the plans of the Texas Steel Co. toward constructing an iron and steel plant at Beaumont has just been taken by the purchase of two large coal properties in Alabama, it is stated by L. P. Featherstone, president of the company. He says that the coal will be used largely for the making of coke which fuel will be brought to Beaumont by barges. One of the coal beds is situated close to the Louisville & Nashville railroad on the Warrior river. It is said to contain more than 2,000,000 tons of coal. The other property is situated in the same section of Alabama and is known to contain a very large tonnage of coal. The Texas Steel Co. is making good progress in rehabilitating the iron furnace and foundry at Rusk, Texas, which it purchased from the state. The foundry will be placed in operation about October 1. It is not definitely known when the construction of the iron and steel plant here will be started, the site for which was acquired some time ago.

To Sell Steel Plant

The Nagle Steel Co., as a part of its plan to concentrate production at its Pottstown, Pa., plant, has authorized the Mitchell-Tappen Co., 15 John street, New York, to sell its open-hearth plant at Rahway, N. J. This plant consists of an open-hearth building containing one 25-ton and one 40-ton furnace served by a 50-ton ladle crane with a 10-ton auxiliary, together with a third 10-ton crane; a steel frame building, a gas producer plant, a power plant, oil storage, etc.

Ample Supply

Of Solvent Naphtha to Fill Demands Say Sellers—Benzol Scarce

New York, Aug. 31.—Since the recent government contracts for solvent naphtha were closed, producers have been overwhelmed with inquiries from consumers, many of whom have feared that the greater portion of the output will go to the government. Although applications for solvent naphtha for commercial use are being considered by the navy department, sellers say there is no reason why consumers should become excited over the fact that the government has contracted to take large quantities. Producers hope to be able to supply all demands as heretofore.

Coke Oven By-Products

	Spot
Per Gallon at Producers Plant	
Pure benzol	$0.22 to .27
Toluol (on sales sanctioned by government) (tank cars)	1.50
Toluol (on sales sanctioned by government) drums	1.55
Toluol (for government)	1.50
Solvent naphtha	.20 to .25
Per Pound at Producers Plant	
Phenol	$0.43 to .47
Naphthalin (nominal)	.09 to .095
Per 100 Pounds at Seaboard	
Sulphate of ammonia (to fertilizer trade)	$4.50 to 4.75
Contract	
Pure benzol	nominal
Toluol	no market
Solvent naphtha	nominal
Per Pound at Producers Plant	
Phenol	nominal
Per 100 Pounds at Seaboard	
Sulphate of ammonia (for commercial use)	no market
Sulphate of ammonia (for government)	$4.50

No orders can be accepted for the present, however, and consumers are urged to have patience until the navy department co-ordinates the situation.

Demand for toluol is much in advance of current production owing to the greatly increased capacity of nitrating plants. The shortage now is equivalent to several hundred thousand gallons. As a result, indications are that very little toluol will be released for delivery to essential commercial consumers during September.

The heavy requirements of the government are causing a scarcity in the supply of benzol. In view of the statistical strength of the market, producers price views are hardening, and consumers who tried to place business at 22 cents per gallon during the past week, succeeded in closing only a portion of their requirements. The market still may be quoted at 22 to 27 cents.

U. S. Training Employment Experts

College Courses Established by War Industries Board Go to Root of Labor Problem —Introduction of Employment Manager One of Greatest Movements Now Taking Place in Industry—New Class Starts

A NEW class in the war emergency courses for the training of employment managers began its studies Sept. 2 at Harvard university, with the Boston university and Massachusetts Institute of Technology co-operating. The next class is scheduled to begin at the University of Rochester, Rochester, N. Y., Sept. 16 and later classes will be organized at the Carnegie Institute of Technology, Pittsburgh, and Columbia university, New York, courses following at about intervals of eight weeks at all of the schools. In previous classes many of the leading industrial plants of the country were represented by students whom they assigned to take the studies.

The plan inaugurated by the employment division of the war industries board, was put in operation under the auspices of the department of labor, the war and navy departments, the United States shipping board and the Chamber of Commerce of the United States, with the cooperation of colleges and universities in Boston, New York, Rochester, Pittsburgh, Seattle and Berkeley, Cal.

Some of the foremost instructors in the country have been obtained by the division to direct the courses and employes are invited to send men or women of their own choosing to become students, subject to the approval of the division. In each of the courses conducted thus far there have been present men of mature experience who have taken the opportunity to review their policies in the light of systematic knowledge, and also younger men intending to specialize in employment management, a new branch in industrial service which is constantly increasing in importance. The standard of mental equipment of those admitted to the classes is high, the division specifying that they must be "first-class men in every respect." The instruction is afforded without any charge for tuition, the only outlay being for the living expenses of the student and about $15 for books and supplies.

Studies Cover Wide Range

While the course of study deals chiefly with the subject of employment management, consideration is also given to statistics, labor economics and business organization and management. Under the heading of organization and equipment of an employment department, the student studies the causes which have produced the need of employment management, the functions of employment departments, the administrative organization of a department, its relations to other departments of a business, types of records and reports used in labor accounting and the layout of an employment department.

As regards the employing of the worker the student studies job specification, analysis of the labor market and its sources of supply, problems of dilution, the selection of employes, physical examinations, and mental tests, discharging, the definition of labor turnover and its calculations and the law of the labor contract. He also studies various branches dealing with the training of the worker, the payment of the worker, the control of working conditions, efforts to keep the worker up to standard and the government of the shop, every feature of an industrial establishment in its relation to the worker being analyzed.

The employment division seeks to give the student the training necessary to make him one of the most important executives in his business. Instruction includes systematic lectures given by experienced teachers, who devote all their time to the work, and special lectures given by men who have had practical experience in special lines. These are supplemented by assigned readings and problems. Studies are made in various plants which illustrate certain types of conditions, or which reveal the effects of certain policies. Daily informal discussions are provided to promote energetic reaction to the new ideas presented and to adjust divergent points of view.

It is necessary that the candidate for the course shall have had three years' experience in factory methods. This experience should have made the candidate familiar with factory tools, machinery, equipment, materials and processes. He should know the meaning of factory life, what its discipline signifies, what the attitude of the worker is to his job, to his boss and to life in general. His studies will equip him to apply every practical mental and vocational test to ascertain the fitness of the prospective employe.

Experience with these courses and the practical results achieved leads the division to the conclusion that the introduction of the employment manager into industry and the standardization of the service of an employment department is one of the greatest movements now taking place in the manufacturing industry. The employment manager is coming in as a new staff man to relieve executives, both in the shop and office, provide for a higher standard of efficiency among the employes and reduce labor turnover. The division emphasizes the special importance of his duties at this time when practically all industrial establishments are in contact with the government as regards labor.

Enlarges Bar Capacity

The property formerly occupied by the Nicholson File Co., Beaver Falls, Pa., recently was bought and is being improved by the Moltrup Steel Products Co. The Moltrup company will use the buildings, together with some additions, by equipping them with machinery, for the manufacture of cold drawn steel bars and other finished steel specialties, such as this company now is producing. Secretary F. H. Guppy says that the company has found it necessary to have additional facilities to handlde its rapidly growing business. The property which it recently purchased contains about 2¾ acres and a portion of it is now covered by factory buildings of brick and frame construction with about 42,000 square feet. Practically all of the machinery to be installed is of a special nature, and will be built by the Moltrup company in its own plant.

Engineers Enlist

The Hooper-Falkenau Engineering Co., Woolworth building, New York City, industrial engineer and architect, has suspended its business for the duration of the war, due to the fact that the principals, G. K. Hooper and A. Faulkenau, have entered the government service. Both men have been commissioned majors in the army. The company's offices in the Woolworth building have been discontinued.

Determined War Spirit Displayed

Plant Conversion to War Production Keeps Machine Tool and Equipment Dealers Busy Despite Absence in August of July's Inquiry and Buying Pyrotechnics—Industrial Effort to Win Continues on High Gear

DETERMINATION to win the war and win it quickly is mirrored in all developments of the machine tool and equipment market during August. This steadfast purpose was more clearly reflected in the latter part of the month when the government ordered 600 locomotive cranes to take care of the requirements of the Emergency Fleet corporation, the military railways and the war and navy departments. This marshalls the forces of all plants building this equipment, until March 1, 1919. Brilliant maneuvers are thus being executed almost weekly on this side of the ocean which match well with the battlefield coups of Foch, Haig, Pershing, et al. Serious consideration has been given by machinery builders, dealers, etc., to the passage of the new 18 to 45 manpower act, since a further labor shortage is anticipated immediately and tool-building plants already are crippled. A growing tendency on the part of the government, however, to keep skilled workers in shops instead of sending them to the trenches is expected to forestall this contingency and remedy the situation. Another order out of Washington is expected to develop much of interest to machine tool and equipment sellers. This is the agreement made by the automobile manufacturers with the war industries board to limit pleasure car production in the last half of 1918 to 25 per cent of the entire 1917 output and the possibility that these plants will be called upon to operate strictly upon a 100 per cent war basis after Jan. 1, 1919.

Shipyard Expansion to Cease

INCREASED output at existing yards instead of expansion is to be the program of the Emergency Fleet corporation. Machine tools ordered for the Sun Shipbuilding Co., Chester, Pa., has been re-routed to go to the Newport News Shipbuilding & Dry Dock Co., at Richmond, Va., where $3,000,000 is being spent for a boiler plant. Orders from shipbuilders for standard types of machines more than compensate for the absence of orders for single-purpose machines. Many inquiries and some orders have been received in the east from Pacific coast yards for large planers, lathes, vertical boring machines, etc. Steady buying is maintained by the eastern shipyards. These include the Downey, Sun, New York, Federal and America Shipbuilding companies.

Ordnance Plant Orders Feature Month

PRESSURE upon machinery dealers chiefly is maintained by ordnance plants. As originally planned the Neville island plant being built by the Steel corporation was to cost $40,000,000. It is reported that $100,000,000 now will be spent upon it and machine tool requirements will be measurably increased. Buying of the list of over 400 machines is under way. In fact, some orders for gun-boring lathes have been placed in Chciago. This movement is expected to gain impetus in a few weeks. A $25,000,000,000 relining plant is to be built in France by the government. Machine tools to a value of $15,000,000 will be purchased and include large gun-boring lathes. Apparently peace proposals are not considerations of moment to the principals engaged in these undertakings since before some of these huge tools can be produced, special machines will have to be built and deliveries are far distant. The Midvale Steel & Ordnance Co., awarded contracts to Alliance, O., builders for the crane requirements of its 16-inch howitzer plant. The American Radiator Co., made large machine tool purchases for its Bayonne, N. J., gun plant. The Tacony Ordnance Co., Tacony, Philadelphia, is expected to place orders soon for 25, 36 and 48-inch boring and turning lathes which it requires for gun forgings. The Wisconsin Gun Co., Milwaukee, has doubled its capacity. The Watervliet Arsenal, Watervliet, N. Y., which recently purchased $165,000 worth of machine tools is expected to place orders shortly for $200,000 additional. Included in a large list issued by the Otis Elevator Co., New York, are 74 three-inch lathes for making recuperators for gun recoil mechanisms.

Shell-Making Receives Increased Attention

TO increase the country's shell-making facilities, the government commandeered a tract of land in Worcester to erect a plant to cost $1,000,000 and a $5,000,000 plant will be built at the Edgewood arsenal, Edgewood, Md. Equipment for a plant to cost a similar amount is being purchased by the Laclede Gas Light Co., St. Louis. It will have a monthly capacity of 300,000 150 and 240 millimeter shells. The American Radiator Co., Buffalo, has received many contracts for 4.7-inch and 155 millimeter gas, star and high explosive shells which has necessitated extensive buying of equipment. Cleveland machinery dealers are interested in an inquiry from the Maxwell Motors Corp., Detroit, for a large number of tools for a shell-making plant and other automobile companies are trying to locate such equipment. Chicago is fast becoming a shell-producing center. The Cribben & Sexton Co., there recently inquired for material to make 22,000 155 millimeter shells daily. Several other concerns are buying equipment with which to produce similar munitions.

Red Tape Delays Railroad Buying

RED tape has served to delay much equipment buying on the part of the railroads. It is stated that, after machine tools are located, before orders are placed, the railroad must find the required quota of motors. While in July it was thought that the New York Central would have by this time, all of its orders placed, these are held up because motors cannot be located in sufficient number. The director of purchases for military railroads, who has no connection with the railroad administration, is to purchase $1,000,000 worth of machine tools for France. The Lima Locomotive Works, Lima, O., is increasing its capacity from 30 to 50 locomotives a month to take care of the government's order for 500 standard freight locomotives. The Pennsylvania, Nickel Plate, Erie, Norfolk & Western, Baltimore & Ohio, Rock Island and several other railroads all figured among the August buyers of and inquirers for equipment. The railroad administration, according to reports current, is negotiating with the Baldwin Locomotive works, for the construction of two additional locomotive plants, one in Chicago and one in the south. This company has issued a tentative inquiry for over 1000 machine tools for the Chicago plant.

Many Definite Tool Lists Awaited

Neville Island's Needs Are Enlarged With Beginning of Buying Movement—Giant List for Chicago Locomotive Works to Keep Builders Busy—Shipbuilding and Munition Making Stabilizes Demand

WITH their attention focused upon Neville island, machinery dealers, chiefly of Pittsburgh, await the issuance of exact machine tool requirements. Revised specifications recently issued are expected to develop a demand for a larger number of tools. A contract for lathes and boring mills has been awarded the Amalgamated Machinery Co., Chicago, and the Allis-Chalmers Co., Milwaukee has a contract for the giant pumps to be used in connection with the turbines being built by the Westinghouse Electric & Mfg. Co. It is expected that early attention will be given to the crane requirements and that 48 ten-ton overhead travelers will be ordered soon in lots of eight.

In the east, a tentative inquiry for the 1000 tools is expected to tax builders greatly. This equipment is for the locomotive plant to be erected in the west by the Baldwin Locomotive Works, Philadelphia. Tractor plants continue to require equipment. The Locomobile Co. of America is making tractor motors at Bridgeport, Conn., and has bought considerable machinery. The General Electric Co. is buying against its recent list of 30. Shipyard inquiry is steadily maintained. A new plant to be erected at Paulsboro, N. J., will increase the demand for plate shop equipment. More cranes are asked for the Alameda plant of the Bethlehem Shipbuilding Corp., and for the Hog island plant of the American International Shipbuilding Corp.

Large market possibilities are rife in the west and some big inquiries are expected to come out in the next few weeks in connection with munition plants. Munitions are being made by the International Harvester Co., which wants about 50 turret lathes. In St. Louis, the Laclede Gas Light Co. has a new plant in building to turn out large quantities of munitions. The Winton Motor Car Co., Cleveland, is inquiring for equipment with which to produce a large order for machine gun tripods.

Some dealers report the used machinery market somewhat dull, after an active season, although many are kept busy answering inquiries and locating material with which to fill orders. Some feel there is a falling off in demand because of the approaching end of hostilities; others, because users believe second-hand equipment will not turn out precision work to meet the exactions of government specifications; and still others see that users refuse to pay the premiums exacted on used tools, with new equipment coming into the market at a better pace than hitherto has been experienced.

Eastern Dealers Bid on Locomotive Plant List

ATTENTION in the eastern machine tool market is centered chiefly on the requirements of the locomotive plant to be erected in Chicago by the Baldwin Locomotive Works, Philadelphia. The list issued involves more than a thousand miscellaneous tools. Aside from this business little in the way of large lists has come before eastern sellers of late. In fact, the general run of current demand is comprised of miscellaneous inquiries for single tools, and even this business in the aggregate is not up to its usual volume.

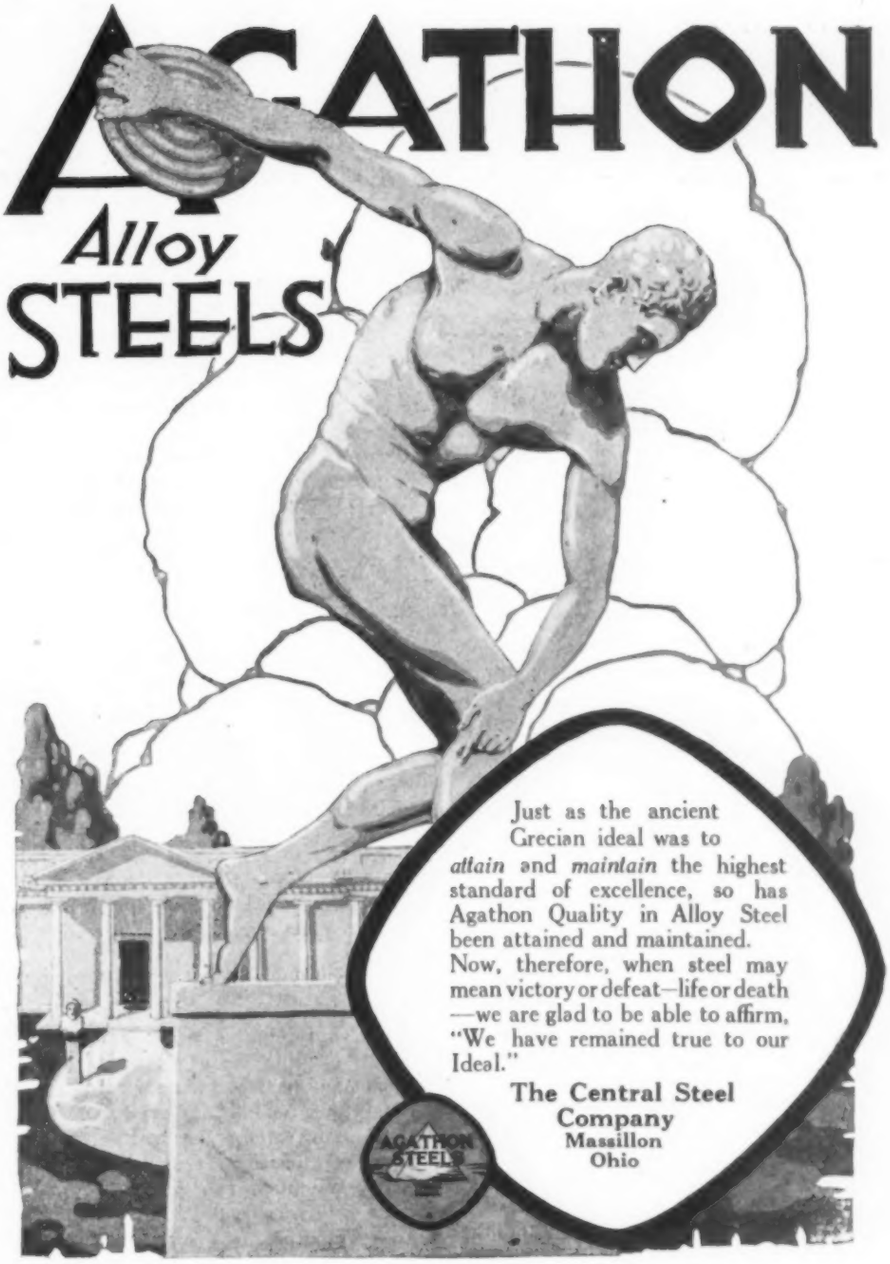
During the past week, the Locomobile Co. of America has purchased additional equipment for its new tractor motor plant at Bridgeport, Conn. The General Electric Co., Schenectady, N. Y., is buying machine tools against a list of 30 or more issued a couple of weeks ago. It is stated that the Ordnance Engineering Co., New York City, will buy manufacturing equipment this week for its plant at Baldwin, Long Island. The company has a government contract for the manufacture of star shells, and recently closed on a list of tool room equipment. Westinghouse, Church, Kerr & Co., New York City, is in the market for some boiler shop equipment. Several lathes and milling machines have been bought by the New York Central railroad. A shipbuilding plant is to be erected at Paulsboro, N. J., by the Fort Mifflin Shipbuilding Co., Philadelphia, which will require plateshop equipment. Large additions to the machine shop and foundry will be included in a $900,000 expansion to be made at the Boston navy yard.

While inquiry for cranes appears somewhat improved, the situation continues relatively quiet. The United States Steel Corp., however, is beginning to figure actively on the requirements of its Neville island plant. It is understood that 48 overhead cranes of 10 tons capacity each will be given first consideration, and that these will probably be bought in groups of eight. The company issued a large tentative list several weeks ago. The Bethlehem Shipbuilding Corp. has issued several new inquiries for cranes for its plant at Alameda, Cal. One 5-ton overhead, with 36-foot span, and two 10-ton overhead cranes, one of 30-foot span and the other of 36-foot span, are to be bought, and also 12 wall cranes of three tons capacity each. These latter cranes are to supersede eight 5-ton wall cranes, inquired for several weeks ago. In addition, the Bethlehem Shipbuilding Corp. is asking for bids on three 3-ton electrically operated locomotive type cranes, with an alternative of three locomotive cranes of similar capacity, to be fueled with oil. The company has placed a 5-ton overhead crane with the Shephard Electric Crane & Hoist Co., Montour Falls, N. Y., for the yard at Sparrows Point.

Another shipbuilder to be in the market at this time is

AGATHON

Alloy STEELS



Just as the ancient Grecian ideal was to *attain* and *maintain* the highest standard of excellence, so has Agathon Quality in Alloy Steel been attained and maintained. Now, therefore, when steel may mean victory or defeat—life or death—we are glad to be able to affirm, "We have remained true to our Ideal."

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Cleveland Office—Hickox Bldg., The Hamill-Hickox Company, District Representative.

Chicago Office—1370 People's Gas Bldg., 122 So. Michigan Blvd., C. H. Beach, District Sales Mgr.

Philadelphia Office—603 Widener Bldg., Frank Wallace, District Mgr.

Syracuse Office—621 University Block, T. B. Davies, District Sales Mgr.

J. E. Dockendorff & Co., 20 Broad St., New York, General Export Agents.

the American International Shipbuilding Corp., which is inquiring for four 10-ton traveling cranes, with 71-foot span, for its yard at Hog Island, Pa. The Newport News Shipbuilding & Dry Dock Co., which recently purchased eight cranes from the Cleveland Crane & Engineering Co. for the proposed marine boiler shop at Richmond, Va., is now in the market for three 30-ton single-legged gantry cranes for the same plant. The Butterworth-Judson Co., New York City, is inquiring for a 10-ton handpower crane, with 44-foot span, for installation in the government picric acid plant at Brunswick, Ga. The Eastern Connecticut Power Co., Norwalk, Conn., has awarded a 15-ton crane, 46-foot span to the Milwaukee Electric Crane & Mfg. Co. The Heppenstall Forge Co., Bridgeport, Conn., has bought a 10-ton overhead crane. The Air Nitrates Co., New York City, is making some minor revisions in the list of cranes to be bought for the two government explosive plants to be erected in Ohio, but will close shortly. The list calls for 10 overhead cranes of 20 tons capacity and eight of five tons capacity. The Pennsylvania Coal Co. is inquiring for a 3-ton overhead crane of special design for its No. 1 colliery at Dunmore, Pa.

Heavy Business Anticipated in Chicago

ALTHOUGH no decided change has taken place in demand for machine tools in the Chicago district, a number of possibilities exist which are expected to bring heavy business during the next few months. Cribben & Sexton, manufacturers of stoves, are inquiring for considerable shell-making equipment for early delivery and probably will take on a contract for munitions. The International Harvester Co. is inquiring for about 50 turret lathes, also for munition work. The Laclede Gas Light Co., St. Louis, is building a large plant for the manufacture of munitions and is expected to be in the market shortly for equipment. As the vacation season ends, general inquiry is somewhat better, but there is still absence of what dealers call "shopping," most inquiries coming by mail. It is noticeable that second hand machinery is in less demand than formerly, and users as a rule will accept it only when new machinery cannot be obtained at reasonable delivery. The feeling seems to be that it will not do sufficiently precise work to meet government requirements. The Allen Bradley Mfg. Co., Milwaukee, will build an addition to its plant. The Baldwin Locomotive Works appears to be going ahead with its project for a plant at East Chicago, Ind., which will require considerable heavy equipment. The American Car & Foundry Co., St. Louis, is having plans prepared for a machcine shop and pattern shop. The Southern Pacific railroad has plans for shops at Roswell, N. Mex. Martinez, Cal., is taking bids on waterworks improvements, including a pump, standpipe, and pumping station. Pierre, S. Dak., has voted a bond issue for rebuilding waterworks and electric light plant which recently were burned.

Cleveland Dealers Enjoy Steady Demand

WHILE Cleveland machine tool dealers are not concerned about any large orders or inquiries, their forces are kept busy with the steady miscellaneous demand. Many salesmen are making what are called "good-will" trips. These calls are made not with the idea of selling machines or taking orders, but for the double purpose of rendering service and keeping their customers' good will. One dealer has approximately $40,000 worth of unfilled orders on hand, several from the White Co., for truck-making equipment, milling machines, screw machines, etc., and several from the American Shipbuilding Co., which continues to buy machinery wherever its requirements can be met. An unusual deal for this district was consummated by the Duplex Machinery Co., Cleveland. It has received an order from the Scott-Fetzer Machine Co., Cleveland, which is doing tank work for the government, for one new Newton 12-inch crank slotting machine. The Winton Motor Car Co. is in the market for screw and milling machines as well as drill presses. It recently obtained a large order for tripods for Browning machine guns. The Standard Equipment Co. has been in the market for similar machinery but is understood to have placed orders for its requirements. An inquiry enters the Cleveland market from Chicago. The John W. Hake Co., of that city, wants several screw machines, shapers and milling machines. The National Grave Vault Co., Galion, O., is in the market for one power press, one power hacksaw and one 16 or 18-inch crank shaper. Dill-Croset, Inc., San Francisco, is trying to locate one each 1½-inch, 1⅝-inch, 2-inch, 2½-inch and 2⅝-inch turret lathes in Cleveland. The New Idea Spreader Co., Coldwater, O., manufacturer of agricultural machinery, wants a new or second hand moveable punch, 14 feet between housings, with a 2 or 3-inch stroke, ram adjustable up and down, bolster and ram to be 12 or 15 inches wide, with capacity to punch 12 half-inch holes in one stroke on ¼-inch steel. It also desires to purchase one eye bender to bend angles and eyes on stock up to ¾1inch round, one 500-pound drop hammer and one 25 to 50-pound power hammer. Several used machinery dealers report a brisk demand while others feel that new equipment is coming along more quickly and users would sooner pay regular prices for it than to pay premium prices for second-hand machines. Some used machines have brought a price 20 per cent in advance of the prevailing price on a new machine of the particular type and size. Recent successes in the war zone have affected some users in that there is a tendency to hold off order placing for expensive heavy machinery. The Craig Tractor Co., Cleveland, is expected to enter the market shortly for equipment. The Van Dorn & Dutton Co., 2978 Woodhill road, is building another plant. James B. Clow & Sons are erecting a machine shop at Coshocton, O.

Pittsburgh's Interest Centers in Neville Island

INTEREST in the Pittsburgh district again is centered in the probable machinery and machine tool requirements of the Neville island ordnance plant. Revised specifications have been put out, but exactly what they call for is carefully withheld, and probably will not be made public until along about the middle of the month, when it is expected the awards will be announced. The Amalgamated Machinery Co., Chicago, has been awarded a contract for lathes and boring mills for the plant, which it is said amounts to several million dollars and the Allis-Chalmers Co., Milwaukee, has been given a contract for pumps, which it is understood are to be used in connection with the giant turbines being built by the Westinghouse Electric Mfg. Co., East Pittsburgh, Pa. As far as can be learned, no other business in connection with the plant has been placed. The general machinery trade as far as new business is concerned, is rather quiet. Rolling mills are reported to be well covered. Small tool requirements also are light just now, suggesting that users have satisfied their needs. Manufacturers are busy on the needs of plants on direct or indirect government work and few are quoting except on long deliveries. On heavy machinery, six months seems to be the shortest date and some companies are booked as far ahead as 12 months. Small stock is obtainable often from stock and for as short delivery as 60 days.

WAR SAVINGS STAMPS

Say you saw it in THE IRON TRADE REVIEW

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Factories

BANGOR, ME.—The Penobscot Foundry Co. has been incorporated with $20,000 capital by Harry J. Russell, Abram Brown and Myer W. Epstein.

ROCKLAND, ME.—The Rockland Motor Co. has been incorporated to make motor vehicles with $10,000 capital by B. B. Smith and W. W. Spear.

SHIRLEY MILLS, ME.—The box mill of the Shirley Lumber Co. was burned Aug. 22, with a loss of $30,000. It will probably be rebuilt.

BARRE, MASS.—Fire damaged a 3-story building occupied by the Charles G. Allen Co., iron founder and machinist, Aug. 21, causing $6000 loss.

BROCKTON, MASS.—The Jenney Electric Mfg. Co. has been incorporated with $100,000 capital by Arthur E. Jenney, Herbert W. Patton, Boston and C. A. Cotton.

BROCKTON, MASS. — The George E. Keith Co. will build a brick, fireproof, 64 x 70.8-foot central heating and power plant with a capacity for five 300 horsepower boilers.

CAMBRIDGE, MASS.—Rosenbaum Bros. purchased 18,898 square feet of land at Broadway and Sixth street and will erect a fireproof building for their metal business.

CARYVILLE, MASS. — The Taft Woolen Co. let the contract for a brick, 1-story, 17 x 80-foot addition to its power house.

CLINTON, MASS.—The Lancaster Mills will build a brick, 8-story, 85 x 260-foot storehouse to be equipped with elevators and sprinkler system.

MARLBORO, MASS.—Plans are being figured for a reinforced concrete, 2-story, 45 x 180-foot manufacturing building, to cost $30,000, for the Koehler Mfg. Co.

PEABODY, MASS.—The Richard Young Co. will build a 2-story addition to its beam house and increase the size of its main building to five stories, to cost $25,000.

SHERBORN, MASS. — A $70,000 power plant will be erected at the Sherborn state reformatory for women.

WORCESTER, MASS. — The McIntosh Machinery Co. has been incorporated with $100,000 capital by George A. McIntosh, Hartley S. Lohnes, Watertown, Mass.; Edward J. Flynn and Herbert N. Davison.

NEW BRITAIN, CONN.—The North & Judd Mfg. Co. has taken out a permit to build a concrete, 1-story storage building to cost $13,000.

STAMFORD, CONN.—The Yale & Towne Mfg. Co. let the contract to the American Concrete Steel Co., Newark, N. J., for a reinforced concrete, fireproof, 6-story, 50 x 261-foot factory.

WATERBURY, CONN.—The Scoville Mfg. Co. has taken out a permit for a steel, 1-story, 40 x 52-foot addition.

Along the Middle Atlantic Seaboard

ALBANY, N. Y.—The George H. Thatcher & Co., Leonard street, will build a 1-story machine shop, 50 x 100 feet, to cost $15,000.

BINGHAMTON, N. Y.—The Binghamton Bridge Co. has purchased property near here for the erection of a hydro-electric plant.

BUFFALO.—The Automatic Transportation Co. has a permit to erect a 3-story plant to cost $40,000.

BUFFALO.—The American Purchase Sales Co., 528 Ellicott square building, will build a boiler house and pump house.

BUFFALO.—The General Drop Forge Co. has let the contract for forge shop alterations and additions.

BUFFALO.—The Atlas Steel Car Co. has let the general contract for a 1-story plant, 60 x 200 feet, to cost $40,000.

BUFFALO. — Albert J. Howard, Norfolk and Northumberland avenues, has contract for the construction of a forge building 80 x 245 feet to be used for government work.

BUFFALO.—The Atlas Steel Castings Co., 1963 Elmwood avenue, recently completed improvements and extensions to its plant. All the necessary equipment has been installed.

BUFFALO.—Bids are being received by the National Lamp Works of the General Electric Co. for the construction of a $100,000 power house and factory building.

GENEVA, N. Y.—A distribution plant to cost $100,000 is contemplated here by the Standard Oil Co.

NIAGARA FALLS, N. Y.—The Niagara Electric Chemical Co., 2700 Buffalo avenue, has had plans prepared for the erection of a 2-story addition, 38 x 151 feet.

SCHENECTADY, N. Y.—The American Locomotive Co. let the contract to the Lackawanna Bridge Co., Buffalo, for an addition to the boiler shop of its works at Dunkirk to cost $150,000.

ALLENTOWN, PA.—The Bethlehem Motors Corp. has let the contract for a warehouse, 80 x 200 feet, to cost $30,000.

ARDMORE, PA.—The Auto Car Co. is taking bids on a heat treating plant, 75 x 125 feet.

BEAVER BROOK, PA.—The C. M. Dodson Coal Co. is planning the installation of electric pumping machinery at its No. 5 colliery.

CHARLEROI, PA.—The Wireton docks of the Pittsburgh Steel Co., which were damaged by fire, will be rebuilt at once.

ERIE, PA.—The Superior Bronze Co. has arranged to build a foundry here.

ERIE, PA.—Building Inspector McManis has approved plans for an addition to the plant of the German Bronze Co. to cost $10,000.

FORT MIFFLIN, PA.—C. W. Parks, chief of the bureau of yards and docks, Washington, is having plans prepared for a $38,000 storage house to be erected here.

FRANKFORD, PA. — The United States government is building a $3,000,000 addition to the benzol distilling plant of the Barrett Co. and will also build an additional power plant.

GAYSPORT, PA.—The McLanahan Stone Co. will start work shortly on the construction of a foundry and machine shop.

GROVE CITY, PA.—The Bessemer Motor Truck Co. has let the contract for a plant 90 x 440 feet, at Holmesburg Junction, Pa., to the Crowell-Lundorf-Little Co., Philadelphia.

GREENVILLE, PA.—The Greenville Mfg. Co. will build a plant for the manufacture of machinery.

GREENVILLE, PA.—The Sharon Waterworks Co. is planning to extend its filtration plant and beds at the pumping station. A 5,000,000 gallon pump will be installed.

HAZELTON, PA.—The Washington Pump & Machinery Corp. is asking bids on addition 100 x 200 feet.

HAZLETON, PA.—The Lehigh Valley railroad is building a roundhouse at Ashmore, near here.

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The whirring of the airplane—the roaring of the fast express—the thundering chug of the rapidly approaching motor truck, all *proclaim the victory of Ohio Steel Castings over "Power"* by proving the ability of these castings to withstand the terrific, racking, straining shocks of the mightiest engines constructed by man.
If you are in need of Tractor, Motor Truck, Automobile or other small castings—castings of a quality and strength fit for the most strenuous service specify *Ohio Steel Castings.*
Let us figure on your requirements.
The Ohio Steel Foundry Co.
Plants
Springfield, Ohio Lima, Ohio Bucyrus, Ohio

HILLSVILLE, PA. — The Carbon Limestone Co. is planning the erection of an addition.

HILLSVILLE, PA.—The Bessemer Limestone Co. will install additional machinery to cost about $40,000. Fred Kanengeiser is general manager.

MILLVALE, PA.—The E. T. Lippert Saw Co. let the contract for a 3-story machine shop addition 37 x 144 feet, to cost $40,000.

PHILADELPHIA.—The Super Glass Mfg. Co. will enlarge its plant by the erection of a 1-story, 48 x 185-foot building and a 1-story 25 x 50-foot building.

PHILADELPHIA.—Barclay White & Co. have the contract for constructing a $3,000,000 addition to the plant of the Midvale Steel Co.

PITCAIRN, PA.—The Pennsylvania railroad will build a machine shop, engine house, storage house and ice and oil house here.

RUTHERFORD, PA.—A. L. Carhart is estimating on plans for an engine house 114 x 132 feet for the Reading Railway Co.

SONEY CREEK, PA.—A 1-story, 82 x 83-foot machine shop will be erected here by the maintenance of way department. Pennsylvania railroad, Philadelphia.

TAMAQUA, PA.—The Reading railway has let the contract to William Riebe, for the erection of an engine shop to cost $25,000.

WASHINGTON, PA. — The Greensboro Gas Co. is preparing plans for the erection of a pumping station.

WHEATLAND, PA. — Excavation for the Pennsylvania roundhouse and shops at Wheatland has been started by a large force of laborers.

WILLIAMSPORT, PA.—The Williamsport Wire Rope Co. let the contract for a $40,000 warehouse, 90 x 200 feet, to the Austin Co., Cleveland.

PITTSBURGH.—The Pennsylvania railroad let the contract for the erection of an engine room, coaling station, ash pit, stall house, etc., to cost $150,000. The contract was let to the Crowell, Lundoff & Little Co., 1951 East Fifty-seventh street, Cleveland.

ELIZABETH, N. J.—The Y. M. C. A. is having plans drawn for a dormitory and cafeteria, 185 x 190 feet, to cost $250,000.

JERSEY CITY, N. J.—The Federal Shipbuilding Co. has acquired 75 acres along the Hackensack river and will build a plant soon.

JERSEY CITY, N. J.—R. H. H. Steel Laundry Co. will build a 4-story, 30 x 76-foot foundry addition. James Mitchell, Inc., will be in charge of the construction.

JERSEY CITY, N. J.—The New Jersey Machine Corp. has been incorporated with $50,000 capital, to manufacture machinery, dynamos, motors, shipyard supplies, etc., by Martin Feybusch, Sea Cliff, N. Y.; Maurice Gallburt, 131 West Twenty-fourth street, New York; James D. Reifsnyder, Weehawken, and William P. Devoe, Upper Montclair, N. J.

NEWARK, N. J.—A $50,000 boiler room will be erected at the plant of the Waas & Walstone Co.

NEWARK, N. J.—The board of education has plans for a four-story, reinforced concrete and steel school house, 250 x 250 feet, to cost $500,000. L. Sonntag, Newark, is the architect.

NEWARK, N. J.—The Eagle Tool & Machine Co. has been incorporated with $25,000 capital to manufacture tools, etc. The incorporators are Charles Kolarsick, George Peck and Leopold Halzi, all of Newark.

POMPTON LAKES, N. J. — F. Kilgus Corp., Newark, has been awarded a contract by the borough council for the erection of a power house to cost $31,406.

TRENTON, N. J.—The American Steel & Wire Co., Hamilton avenue, will erect a concrete pump house and tower to cost $3500.

TRENTON, N. J.—The state of New Jersey will install new cells and appliances at criminal insane building to cost $23,338. F. H. Bent is the state architect.

WHARTON, N. J.—The Wharton Steel Co. has acquired title to nine acres along the Morris canal and will equip the same for a railroad yard.

BALTIMORE.—The American Ice Co., 309 Calvert building, will build a 1-story engine room, 12 x 18 feet.

BALTIMORE.—J. T. Louis & Bros. Co. let the contract for the construction of a $2,500,000 plant to the McIver Construction Company.

BALTIMORE.—Government officials awarded a contract to the Crown Cork & Beal Co. for cartridges for the war department and machinery will be installed.

BALTIMORE. — The American Can Co., Union Trust building, let the contract to the N. M. Loney Co., Baltimore, for the erection of a 3-story plant.

CUMBERLAND, MD.—The American Celulose & Chemical Mfg. Co. will build a plant here to cost $5,000,000.

FAIRFIELD, MD.—The Union Shipbuilding Co. has acquired property adjoining its plant and plans the erection of an addition.

NORFOLK, VA.—The Atlantic Iron Works will erect a $17,000 plant addition, two stories, 52 x 122 feet.

Business Changes

SINCE Sept. 1, the Lancashire Dynamo & Motor Co., of Canada, Ltd., Toronto, Ont., has been located in new and larger quarters at the corner of Niagara and Bathurst streets. It will have facilities to handle machinery efficiently up to 10 tons.

* * *

The James H. Herron Co., Cleveland, consulting engineer, has found it necessary to move into larger and more convenient quarters at 1360 to 1364 West Third street, due to the increased demand for its services.

* * *

The Independent Filter Press Co. has removed its offices from 47 West Thirty-fourth street, New York, to 418 Third avenue, Brooklyn.

* * *

The E. M. Dart Mfg. Co., Providence, R. I., is now located in its new building located on Thurbers avenue at Eddy and Blundell streets. Mail address is 134 Thurbers avenue.

* * *

The Metal & Thermit Corp., announces that its Toronto, Ont., office has been moved from 103 Richmond street, W., to 15 Emily street.

* * *

A. C. Dallas & Son, Inc., Chicago, has changed its name to the Dallas Brass & Copper Co.

* * *

The New England Machinery Co., New Haven, Conn., has changed its name to the New England Wire Machinery Co.

* * *

The E. H. Mumford Co., Elizabeth, N. J., has changed its name to the Dayton Molding Machine Co., and will operate a plant and offices at Dayton, O.

Activities in the Central States

APPLETON, WIS.—A 1-story brick service station, costing $15,000, will be erected by the Schlafer Hardware Co., 817 College avenue. Architect Henry Wildhagen is preparing plans.

CABLE, WIS.—A new chemical and dyestuffs plant is being established here by the Sunbeam Chemical Co. Work has started on a main building, 75 x 300 feet, and a separate power house.

CASHTON, WIS.—The village board of trustees has awarded a contract to the Des Moines Bridge & Iron Co., Des Moines, Iowa, for furnishing and installing an 80,000-gallon steel tank, mounted on a 75-foot steel tower.

GREEN BAY, WIS.—The Northwest Engineering Works has awarded contracts for the construction of an addition to cost about $35,000. The work is in charge of L. Hanson, Green Bay.

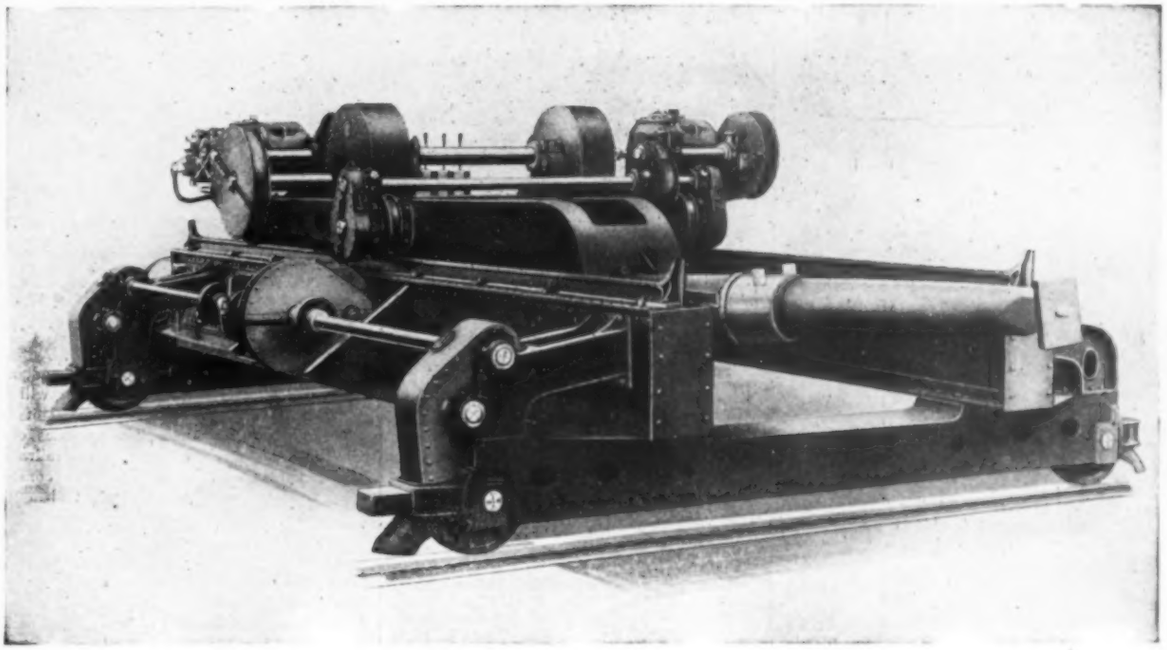
HARTFORD, WIS.—A plant for the manufacture of gas engine silencers and sheet steel products will be built by the International Steel Prducts Co. A site of 3½ acres has been purchased and several buildings will be erected immediately.

KENOSHA, WIS. — The Winther Motor Truck Co. has awarded the contract for steel sash for its new factory building, 175 x 300 feet, to the Truscon Steel Co., Caswell block, Milwaukee.

MANITOWOC, WIS.—The Manitowoc Shipbuilding Co. has awarded a contract to Walter W. Oeflein, Inc., 86 Michigan street,

W-S-M

STEEL PLANT EQUIPMENT
COKE OVEN MACHINERY
GAS PRODUCERS
ORE AND COAL HANDLING MACHINERY
SPECIAL CRANES
MINING MACHINERY
HYDRAULIC TURBINES



Charging Machines

The Wellman-Seaver-Morgan Company originated, first built, developed, and for many years was the sole constructor of mechanical chargers for open hearth furnaces.

The W-S-M Low Type Charger is pictured above. Some conditions indicate the use of the High Type Charger or the Crane Type.

We are prepared to build a special machine for your particular requirements.

Bulletin A 7, "W-S-M Charging Machines and Manipulators," will be sent on request.

THE WELLMAN-SEAVER-MORGAN CO.
CLEVELAND, OHIO, U.S.A.

Milwaukee, for erecting a dormitory building. The company also will build 100 workmen's dwellings in Manitowoc.

MADISON, WIS.—The Northwestern Ordnance Co. has a permit to erect a one-story addition, 50 x 100 feet, costing $10,000.

MILWAUKEE.—F. W. Taddey, 1705 Chestnut street, has the contract for constructing a reinforced concrete and steel bridge over the Kinnickinnic river.

MILWAUKEE. — Swift & Co., Chicago, lessee of the Plankinton Packing Co., is making an expenditure of about $75,000 in the enlargement of the power plant. The addition will be 35 x 70 feet.

NEENAH, WIS.—The S. Heller Co., Milwaukee, has the contract for electric freight elevators in a large warehouse addition being erected for the Lakeside Paper Co. at a cost of $75,000.

RACINE, WIS.—The Hamilton Beach Mfg. Co. is building a 3-story factory, 80 x 150 feet, at a cost of $50,000.

RHINELANDER, WIS.—A boiler house, 50 x 75 feet, will be erected by the Rhinelander Paper Co., and will cost about $25,000.

TOMAHAWK, WIS.—A power house, with a water wheel and other equipment, will be erected on the Tomahawk river at Jersey City by the Tomahawk Light, Telephone & Improvement Co. at a cost of $20,000.

WEST ALLIS, WIS. — The North End Foundry Co. is building a shop addition 60 x 80 feet to cost $15,000.

LA SALLE, ILL.—The Matthiessen & Hegeler Zinc Co., is planning to erect a shop and store building, 130 x 260 feet. The contract for the construction has been let to E. L. Archibald & Co., 111 W. Washington street, Chicago.

PERU, IND.—The Lake Erie & Western railroad will build a 10-stall roundhouse at Peru and has plans for a 20-stall roundhouse at Lima, O. The Arnold Co., Chicago, has both contracts.

BELLEVUE, O.—The railroad administration has approved an expenditure of from $75,000 to $100,000 for extensive improvements and additions to the local yards of the Nickel Plate railroad.

BRYAN, O.—The Toledo Residence Construction Co. has the contract for the erection of the municipal light and power plant to be built here at a cost of $34,400.

CINCINNATI. — The John H. McGowan Co. is planning the erection of an addition to its plant at 54-58 Central avenue.

CINCINNATI. — Improvements to cost $25,000 will be constructed by the Herschede Hall Clock Co.

CINCINNATI.—The P. W. Drackett Sons Co. is planning improvements to its plant at a cost of $13,000.

CLEVELAND. — The Bolton Pratt Construction Co., 801 Columbia building, has the contract to construct a $32,000 factory building at 1809 St. Clair avenue, for the W. & M. Realty Co.

CLEVELAND.—The Van Dorn & Dutton Co., 2978 Woodhill road, is contemplating the erection of a $60,000 factory and has bought a site for the purpose.

CLEVELAND.—A 3-story addition, 56 x 180 feet, is being erected at the plant of the Cleveland Pneumatic Tool Co., for which all new machinery has been purchased.

COSHOCTON, O.—James B. Clow & Sons are planning the erection of a machine shop. Plans have not been completed.

DAYTON, O.—A permit has been issued by the city building department for the construction of an addition to the Pythian temple, which is to be erected at a cost of $28,350. The H. R. Blagg Co. has the contract.

DELAWARE, O.—Ray Hopper has the contract for the construction of the Citizens Telephone building.

LANCASTER, O.—The Alten Foundry & Machine Works Co. contemplates the erection of an addition.

LORAIN, O.—The Baltimore & Ohio railroad has started improvements to its local round house. The improvements will cost about $156,000.

PAINESVILLE, O.—The Osborn Engineering Co., Cleveland, has the contract for the repairing of the bridge over the Grand river.

SALEM, O.—As the result of the purchase of all the stock of the Salem China Co. by F. A. Sebring, Sebring, O., it is expected the plant will be enlarged by the erection of several additional kilns.

SOUTH CHARLESTON, O.—George B. Hicks has closed a contract with the government to erect a shell heat testing building at Mansfield, O., to be 127 x 442 feet. The building will cost $85,000.

TOLEDO, O.—Fifty additional acres have been acquired by the Air Nitrates Corp. for its Toledo plant.

TOLEDO, O.—Architects Mills, Rhines, Bellman & Nordhoff will draw plans for the $200,000 auto training school to be built on the Toledo University grounds.

LOUISVILLE, KY.—John Griffith & Son, Chicago, has the contract for the construction of the artillery camp at Stithton, Ky., which is to cost $15,000,000.

Government Inquiries

BIDS on the following equipment are desired by the navy department, bureau of supplies and accounts:

Taper forging roll, 5364½, Sept. 9, Puget Sound.

Lathes and drills, 5447½, Sept. 9.

Boring and turning mill, 5511½, Sept. 9, Norfolk.

Six portable electric drills, 5539½, Sept. 9, Philadelphia.

Three pipe bending, one drill, one multiple vertical drill, one pump, one drilling and tapping, one grinder disc, two bolt cutting, one threading and cutting, and two pipe threading and cutting machines, one arbor press, one wet grinder, sensitive drills, 1939, Sept. 23, Philadelphia.

Machine tools, drills, lathes, milling machines, profiling machines, etc., 1940, Sept. 24, Washington.

Milling machines, 5510½, Sept. 13, Norfolk.

Boring, drilling and milling machines, 5512½, Sept. 13, Philadelphia.

Six bench grinders, 5516½, Sept. 13, Newport.

Tool post grinders, 5517½, Sept. 13, Newport.

One radial drill, 5546½, Sept. 16, Philadelphia.

One post planing machine, 5623½, Sept. 16, South Charleston.

Two punches and shears, 5584½, Sept. 16, F. O. B. works.

Milling machine, 5615½, Sept. 16, Newport.

Drilling machine, 5619½, Sept. 16, South Charleston.

Two grinding machines, 5621½, Sept. 16, South Charleston.

Six flat turret lathes, 5600½, Sept. 13, Boston.

Cutting-off planing machines, 5618½, Sept. 16, South Charleston.

Planing machines, 5620½, Sept. 16, Charleston.

Machine tools, including woodworkers' lathes, band and circular saws, jointer, disc sander, brazer, planer, etc., 5626½, Sept. 9, submarine base, Connecticut.

Twenty electric hand drills, 5638½, Sept. 13, F. O. B. works.

Machine tools, including shapers, milling machines, etc., 5646½, Sept. 13, Puget Sound.

Machine tools, including lathes, planers and pipe threading machines, 5653½, Sept. 13, Puget Sound.

Tool grinders, hacksaws, drills, centering machines, drill presses, etc., 5654½, Sept. 13, Puget Sound.

One bolt threading machine, 5664½, Sept. 13, Charleston.

One belt-driven power press, 5682½, Sept. 13, Washington.

Boring and turning mills, 5707½, Sept. 13, Norfolk.

Two engine lathes, 5718½, Sept. 16, Newport.

One drilling and tapping machine, 5752½, Sept. 16, Brooklyn.

Lathes, 5770½, Sept. 16, Brooklyn.

Tools for shop equipment, including engine lathe and drill press, 5773½, Sept. 16, Philadelphia.

Machine tools, 5783½, Sept. 13, Philadelphia.

Forty-eight tool grinders, 5788½, Sept. 20, Charleston.

Schedule numbers, dates of opening and places of delivery follow the specifications of the tools.

New Business in Canada

NEW WESTMINSTER, B. C. — Robert Abernethy, manager of the Euburne Sawmill Co., whose plant was badly damaged by fire with a loss of $150,000, recently stated the company intended to rebuild. New equipment and machinery of the latest type will be installed.

PRINCETON, B. C.—The Canadian Copper Corp., Greenwood, B. C., will spend $3,000,000 on development work at its mines. The work to be undertaken includes electrical installation of various apparatus, railroad construction, a new mill, etc. The construction of a new concentration plant has already started.

VANCOUVER, B. C.—The Hygiene Products Co., Winnipeg, Man., will build a factory here to cost about $60,000.

VANCOUVER, B. C.—The C. P. Cole & Co., Board of Trade building, has had plans prepared for the erection of a plant to cost $70,000.

VICTORIA, B. C.—A company has been formed in which George Watson, 647 Johnson street, is manager, and will commence immediately on the construction of a floating drydock.

VICTORIA, B. C.—The Foundation Co. has had plans prepared for the erection of an extension to its shipyards to cost about $150,000. Bayly Hopkins is general manager of the company.

ELMIRA, ONT.—The Elmira Rubber Co. will build an addition to its factory at a cost of $30,000. Bids are being received by A. J. Copeland, the Dominion Tire Co.

HAMILTON, ONT.—Bids are being received by Gordon Hutton, Bank of Hamilton building, for the erection of a reinforced concrete addition to the plant of the Frost Wire Fence Co., to cost about $40,000.

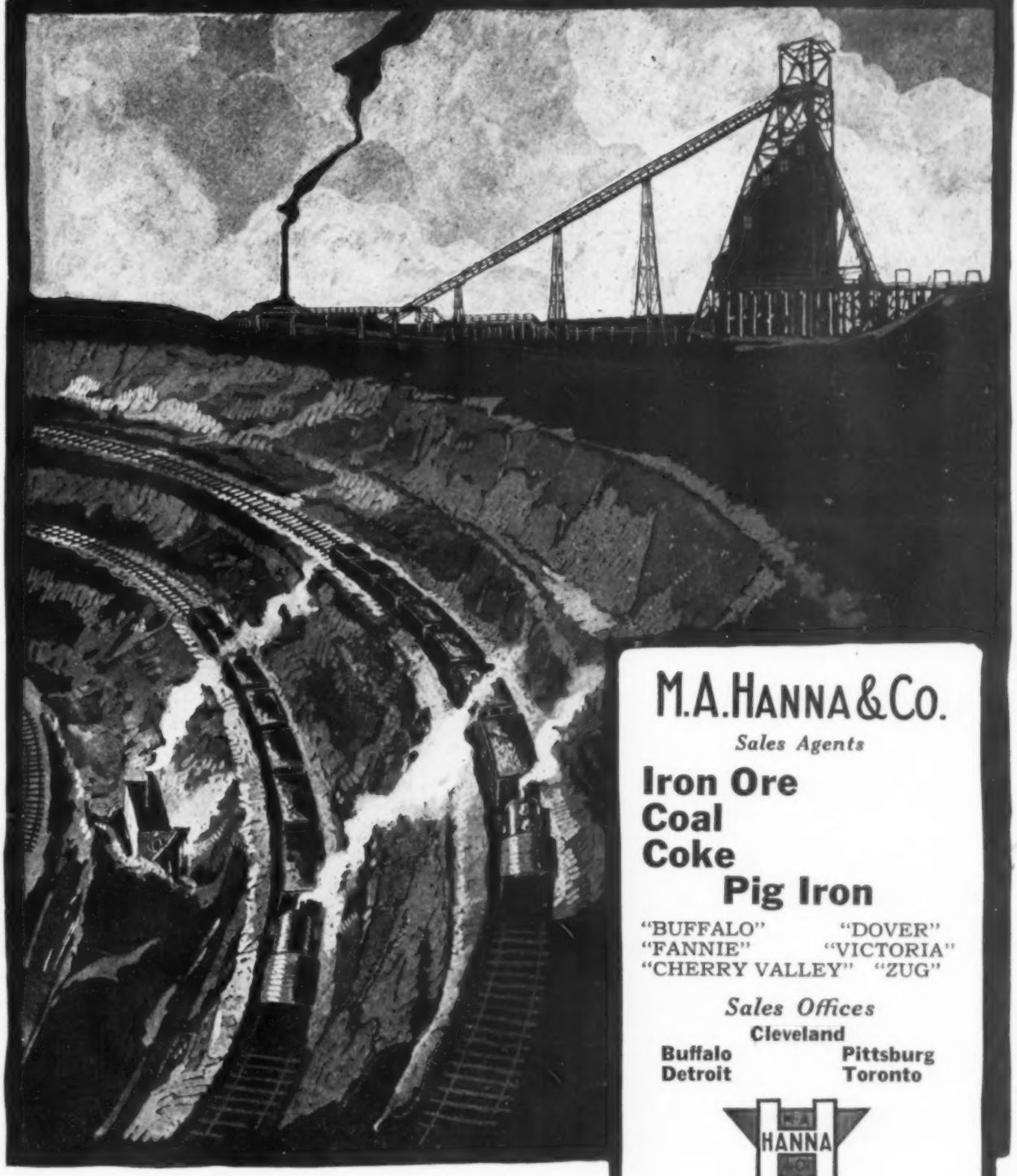
HAMILTON, ONT.—The Canadian Engineering & Construction Co. has been awarded the contract for the erection of an addition to the plant of the Dominion Foundries, Ltd., to cost $75,000.

KITCHENER, ONT.—The Canadian Consolidated Rubber Co. is receiving bids for the erection of a factory addition to cost about $40,000.

LINDSAY, ONT.—The Boving Hydraulic & Engineering Co., Ltd., Wellington street, will build an addition to its plant at a cost of $25,000.

TORONTO, ONT.—The Canada Metal Co. has been granted a permit to erect an addition to cost $5000.

HANNA



M. A. HANNA & CO.

Sales Agents

Iron Ore
Coal
Coke
Pig Iron

"BUFFALO" "DOVER"
"FANNIE" "VICTORIA"
"CHERRY VALLEY" "ZUG"

Sales Offices

Cleveland
Buffalo **Pittsburg**
Detroit **Toronto**

M.A. HANNA CO.

Say you saw it in THE IRON TRADE REVIEW

Iron and Steel Prices

Corrected to Tuesday Noon

IRON ORE

Superior Ores, Per Ton, Lower Lake Ports	
Old range Bessemer, 55 iron	$6.40
Mesabi Bessemer, 55 iron	6.15
Old range non-Bess., 51½ iron	5.65
Mesabi non-Bess., 51½ iron	5.50

WAREHOUSE PRICES

Steel bars, Chicago	4.17c
Steel bars, Cleveland	4.07c
Steel bars, Detroit	4.13c
Steel bars, Philadelphia	4.13c
Steel bars, New York	4.145c
Steel bars, St. Louis	4.24c
Steel bars, Cincinnati	4.13c
Steel bars, St. Paul	4.395c
Steel bars, Buffalo	4.10c
Iron bars, Buffalo	4.70c
Iron bars, Chicago	4.10c
Iron bars, Cleveland	4.67c
Iron bars, Detroit	4.75c
Iron bars, St. Louis	4.24c
Iron bars, Cincinnati	4.13c
Iron bars, Philadelphia	4.60c to 4.73c
Iron bars, New York	4.745c
Shapes, Chicago	4.27c
Shapes, Detroit	4.23c
Shapes, St. Louis	4.34c
Shapes, St. Paul	4.495c
Shapes, New York	4.245c
Shapes, Cleveland	4.17c
Shapes, Philadelphia	4.23c
Shapes, Buffalo	4.20c
Shapes, Cincinnati	4.23c
Plates, Buffalo	4.45c
Plates, Chicago	4.52c
Plates, Detroit	4.48c
Plates, St. Louis	4.59c
Plates, St. Paul	4.745c
Plates, New York	4.495c
Plates, Cleveland	4.42c
Plates, Philadelphia	4.48c
Plates, Cincinnati	4.48c
No. 10 blue anl. sheets, Chi.	5.52c
No. 10 blue anl. sheets, Cleve.	5.42c
No. 10 blue anl., Buffalo	5.45c
No. 10 blue anl., sheets, St. L.	5.59c
No. 10 blue anl. sheets, Cinci.	5.48c
No. 10 blue anl. sheets, St. Paul	5.745c
No. 10 blue anl. sh., Detroit	5.48c
No. 28 black sheets, Chgo.	6.27c
No. 28 black sheets, Cleve.	6.42c
No. 28 black sheets, Cinci.	6.48c
No. 28 black, Detroit	6.48c
No. 28 black sheets, St. L.	6.59c
No. 28 black sheets, St. Paul	6.745c
No. 28 galv. sheets, Chgo.	7.52c
No. 28 galv. sheets, Cleve.	7.67c
No. 28 galv. sheets, Cinci.	7.73c
No. 28 galvanized, Detroit	7.73c
No. 28 galv. sheets, St. L.	7.59c
No. 28 galv. sheets, Buffalo	7.70c
Hoops, Cleveland	4.92c
Hoops, Detroit	4.98c
Hoops, Buffalo	4.95c
Cold rolled sheets, Buffalo	6.45c
Cold rolled steel	list and 10

IRON AND STEEL SCRAP

(Prices in Gross Tons)

STEEL WORKS USE

Bundled sheets, Cincinnati	$23.00 to 23.50
Bundled sheets, Pittsburgh	22.00
Bundled sheets, Cleveland	26.00 to 27.00
Bundled sheets, Buffalo	24.00 to 25.00
Boiler plate, cut, No. 1, Chg.	27.50 to 28.50
Boiler plate, cut No. 1, St. L.	26.50 to 27.00
Frogs, switches, guards, St. L.	28.50 to 29.00
Frogs, switches, guards, Chgo.	29.00
Heavy melting steel, Pitts.	29.00
Heavy melting steel, Buffalo	30.00
Heavy melting steel, Chgo.	29.00
Heavy melt'g steel, Cleveland	29.00
Heavy melting steel, Cinci.	28.00 to 28.50
Heavy melt'g steel, east. Pa.	28.00 to 29.00
Heavy melting steel, N. Y.	26.00
Heavy melting steel, St. L.	28.50 to 29.00
Heavy melt'g steel, Birming.	27.00 to 27.50
Baled sheets, Cleveland	28.50 to 29.00
Baled sheets, Pitts	26.00
Baled sheets, Chgo	29.00
Knuckles, couplers, Chgo.	34.00
Knuckles, coup., St. Louis	33.00 to 33.50
Low phos. steel, Buffalo	37.50
Low phos. steel, Pittsburgh	39.00
Low phos. crops eastern Pa.	39.00
Low phos. guaranteed E. Pa.	36.50
Shoveling steel, Chicago	29.00
Shoveling steel, St. Louis	28.00 to 28.50
Springs, Chgo.	34.00
Steel rails, short, Chicago	34.00
Steel rails, short, Cleveland	34.00
Steel rails, short, St. Louis	32.50 to 33.00
Steel rails, old, Birmingham	28.00 to 30.00
Stove plate, Chgo.	28.00 to 28.50
Stove plate, Cincinnati	22.50 to 23.00
Stove plate, St. Louis	25.50 to 26.00
Stove plate, N. J. points	27.25
Stove plate, Birmingham	24.00 to 25.00
Stove plate, Buffalo	27.50 to 28.00
Stove plate, eastern Pa.	29.00
Stove plate, Cleveland	25.00 to 25.50
Stove plate, Pittsburgh	26.50 to 27.00

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$1.40
Newark, N. J.	4.40
Boston	4.60
Philadelphia	4.10
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70
Buffalo to:	
Albany, N. Y.	$1.75
New England (rail)	3.90
New York and Brooklyn (rail)	3.90
Virginia furnaces to:	
Philadelphia	$4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40
Birmingham, Ala., to:	
Boston	$7.50
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York (r. and w.)	7.50
Philadelphia (r. and w.)	6.60
Pittsburgh	6.10
Savannah, Ga.	3.40
St. Louis	4.25
Chicago to:	
Des Moines	$3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90
Ironton and Jackson, O., to:	
Chicago	$3.75
Cincinnati	1.75
Cleveland	2.40
Detroit	2.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70
Duluth, Minn., to:	
Minneapolis, St. Paul	$1.60
Mayville, Wis.:	
Minneapolis-St. Paul	$2.20

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	24.5 cents
Philadelphia	23.0 cents
Boston	27.0 cents
Buffalo	21.5 cents
Baltimore	22.5 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	56.5 cents
Pacific coast (all rail)	$1.25
Pacific coast (tin plate)	1.25

IRON MILL USE

Angle bars, iron, Chgo.	39.00
Angle bars, steel, St. Louis	32.00 to 32.50
Angle splice bars, St. Louis (iron)	37.50 to 38.00
Arch bars, transoms, Chgo.	45.50 to 46.50
Arch bars and transoms, St. Louis	45.50 to 46.00
Busheling, No. 1, Cleveland	30.50 to 31.00
Busheling, No. 1, Buffalo	29.00 to 30.00
Busheling, No. 2, Buffalo	21.00 to 23.00
Busheling, No. 1, Pittsburgh	32.00
Busheling, No. 1, Cincinnati	26.00 to 26.50
Busheling, No. 1, Chgo.	30.50 to 31.00
Busheling, No. 2, Chgo.	20.00 to 21.00
Busheling, No. 1, St. Louis	30.50 to 31.00
Cast borings, New York	16.25 to 16.75
Cast borings, eastern Pa.	19.00
Cast borings, Buffalo	18.00 to 19.00
Cast, borings, Cleveland	18.50 to 19.00
Cast borings, Cincinnati	16.50 to 17.00
Cast borings, Pittsburgh	19.00
Cast borings, Birmingham	17.00 to 18.00
Cast borings, Chgo.	18.50 to 19.00
Cast borings, St. Louis	18.50 to 19.00
City wrought, long, N. Y.	30.00
Cut forge, Chgo.	32.00 to 32.50
Forge flashings, small, Cleve.	28.00 to 29.00
Forge flashings, large, Cleve.	27.50 to 28.00
Forge No. 1, eastern Pa.	28.00 to 29.00
Grate bars, Buffalo	27.50 to 28.00
Grate bars, Cleveland	25.50 to 26.00
Grate bars, N. J. points	27.25
Iron axles, Pittsburgh	46.50
Iron axles, Cincinnati	43.50 to 44.00
Iron axles, Cleveland	46.50
Iron axles, Chicago	46.50
Iron axles, eastern Pa.	46.50
Iron axles, St. Louis	46.00 to 46.50
Iron axles, Buffalo	45.00 to 47.00
Iron rails, Chicago	39.00
Iron rails, Buffalo	36.00 to 37.00
Iron rails, Cincinnati	34.00 to 35.00
Iron rails, St. Louis	38.50 to 39.00
Iron rails, Cleveland	37.00 to 38.00
Machine turnings, Cincinnati	17.00 to 17.50
Machine turnings, Cleve.	18.50 to 18.75
Machine turnings, Buffalo	17.00 to 17.50
Machine turnings, N. Y.	16.25 to 16.75
Machine turnings, Pitts.	18.00 to 19.00
Machine turnings, east. Pa.	19.00
Machine turnings, Birming.	16.00 to 17.00
Machine turnings, Chicago	17.50 to 18.00
Machine shop turnings, St. L.	18.50 to 19.00
Pipes and flues, Cleveland	28.00 to 29.00
Pipes and flues, Chicago	27.50 to 28.00
Pipes and flues, St. Louis	27.50 to 28.00
R. R. mch. cast, No. 1, Buff.	34.00
R. R. wrgt. No. 1, Buffalo	34.00
R. R. wrgt., No. 1, east Pa.	[illegible]
Railroad wrgt. No. 1 Cinci.	33.50 to [illegible]
Railroad wrgt., No. 1, Cleve.	[illegible]
R. R. wrought, No. 1, Pitts.	34.00
Railroad wrgt., No. 2, Chgo.	32.00 to [illegible]
Railroad wr'ght, No. 1, Chgo.	33.50 to [illegible]
R. R. wrgt. No. 1, Birming.	29.00 to [illegible]
No. 1 yard wrought East Pa.	[illegible]
No. 1 busheling wrgt., E. Pa.	[illegible]
Sheet wrought, Pittsburgh	[illegible]
Railroad wrgt., No. 1, St. L.	33.50 to [illegible]
Railroad wrought, No. 2	32.50 to 33.00
Wrought pipe, Buffalo	27.00 to 28.00
Wrought pipe, eastern Pa.	33.00
Wrought pipe, ungraded, eastern Pa.	29.00

IRON OR STEEL WORKS USE

Axle turnings, Cleveland	$24.00
Axle turnings, Buffalo	24.00
Heavy axle turn'gs, E. Pa.	24.00
Heavy axle turnings, Pitts.	24.00
Shafting, New York	35.50
Shafting, eastern Pa.	39.00
Steel car axles, Pittsburgh	46.50
Steel car axles, Birmingham	38.00 to 40.00
Steel car axles, New York	43.00
Steel car axles, Buffalo	44.00 to 46.00
Steel car axles, Cleveland	44.00
Steel car axles, eastern Pa.	46.50
Steel car axles, Chgo.	46.50
Shafting, St. Louis	38.00 to 39.00
Steel car axles, St. Louis	46.00 to 46.50

IRON FOUNDRY USE

Car wheels, (iron), Pitts.	$29.00
Car wheels, (steel), Pitts.	34.00 to 35.00
Car wheels, eastern Pa.	29.00
Car wheels, Buffalo	29.00
Car wheels, Chicago	29.00
Car wheels, St. Louis	28.50 to 29.00
Car wheels, Birmingham	29.00 to 30.00
Car wheels, Cleveland	30.00
Tram car wheels, Birming.	28.00 to 29.00
Cast, No. 1, Birmingham	29.00 to 30.00
Cast, No. 1, cupola east. Pa.	34.00
Cast, No. 1, Cleveland	33.00 to 34.00
Cast, No. 1, Cincinnati	33.00 to 34.00
Cast, 1, heavy, N. Y.	32.25 to 32.50
Cast, 1, machy., N. Y.	32.25 to 32.50
Cast, No. 1, Chicago	34.00
Cast, No. 1, Pittsburgh	32.50 to 33.00
Cast, No. 1, St. Louis	32.00 to 32.50
Malleable, Cincinnati	30.00 to 34.00
Malleable, Cleveland	30.00 to 34.00
Malleable, Buffalo	29.00 to 34.00
Malleable, Pittsburgh	33.00 to 34.00
Malleable, east. Pa.	29.00
Malleable, cupola, East Pa.	33.00
Malleable railroad, Chgo.	34.00
Malleable, agricultural, Chgo.	33.00 to 33.25
Malleable railroad, St. Louis	32.00 to 32.50
Malleable agricultural, St. L.	31.00 to 31.50

MISCELLANEOUS USES

Boiler punchings, Chgo.	36.00 to 36.50
Reroll. rails, 5 ft. & ov., Pitts.	34.00
Reroll. rails, 5 ft. & ov., Chgo.	34.00
Reroll. rails, 5 ft. & ov., E. Pa.	34.00
Reroll. rails, 5 ft. & ov., St. L.	33.50 to 34.00
Reroll. rails, 5 ft. or over, Cleve.	34.00
Rerolling rails, long, Birm.	37.50 to 38.50
Locomotive tires, Chgo.	45.50 to 46.50
Locomotive tires, St. Louis	43.50 to 44.00